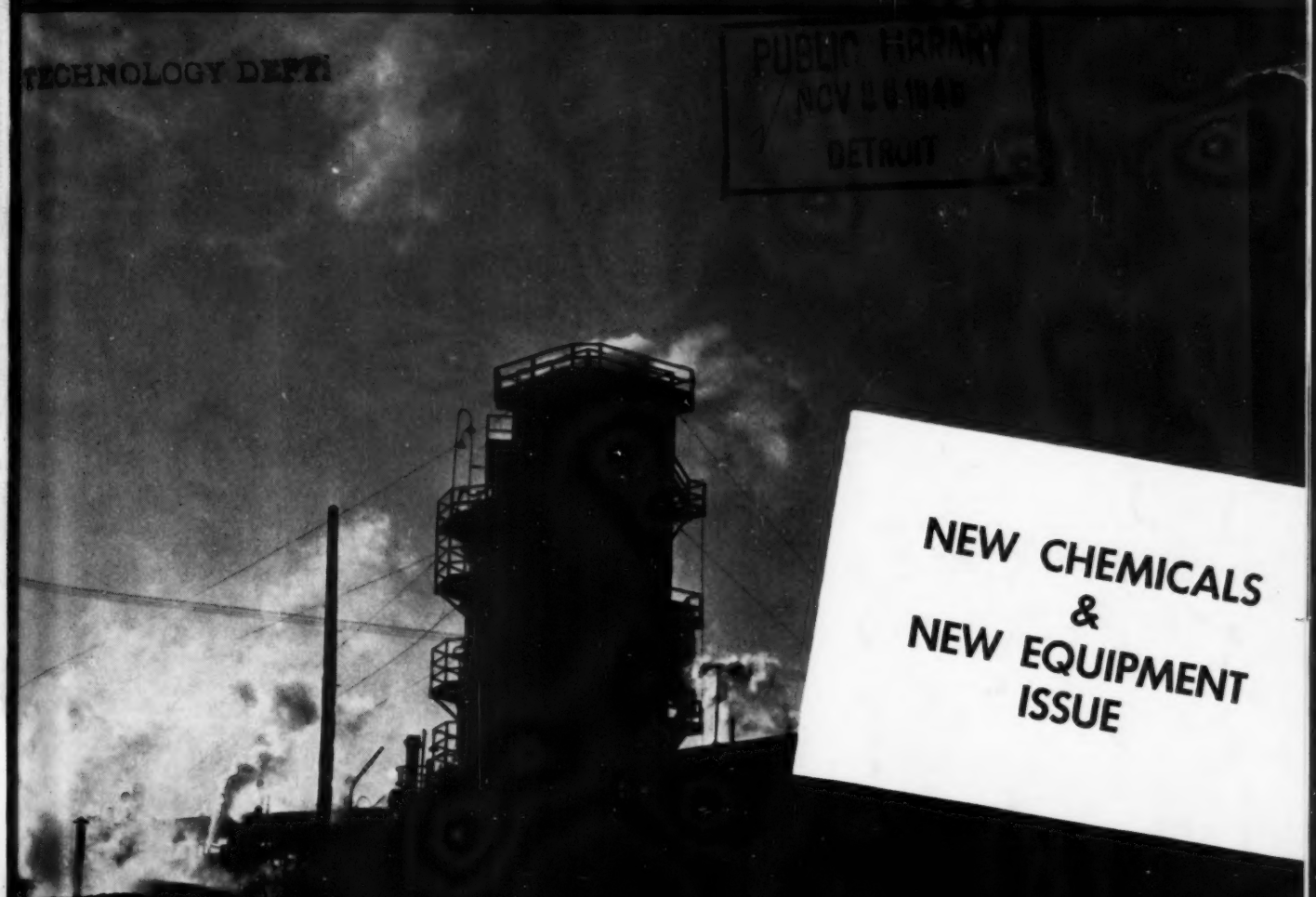
vember 1945

Chemical Industries

IN THIS ISSUE



NEW CHEMICALS & NEW EQUIPMENT ISSUE

What's Ahead for Chemical Industry? p. 828

IN PEACE...as in war

Leather Needs Alkalies

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TANNERS ALKALI

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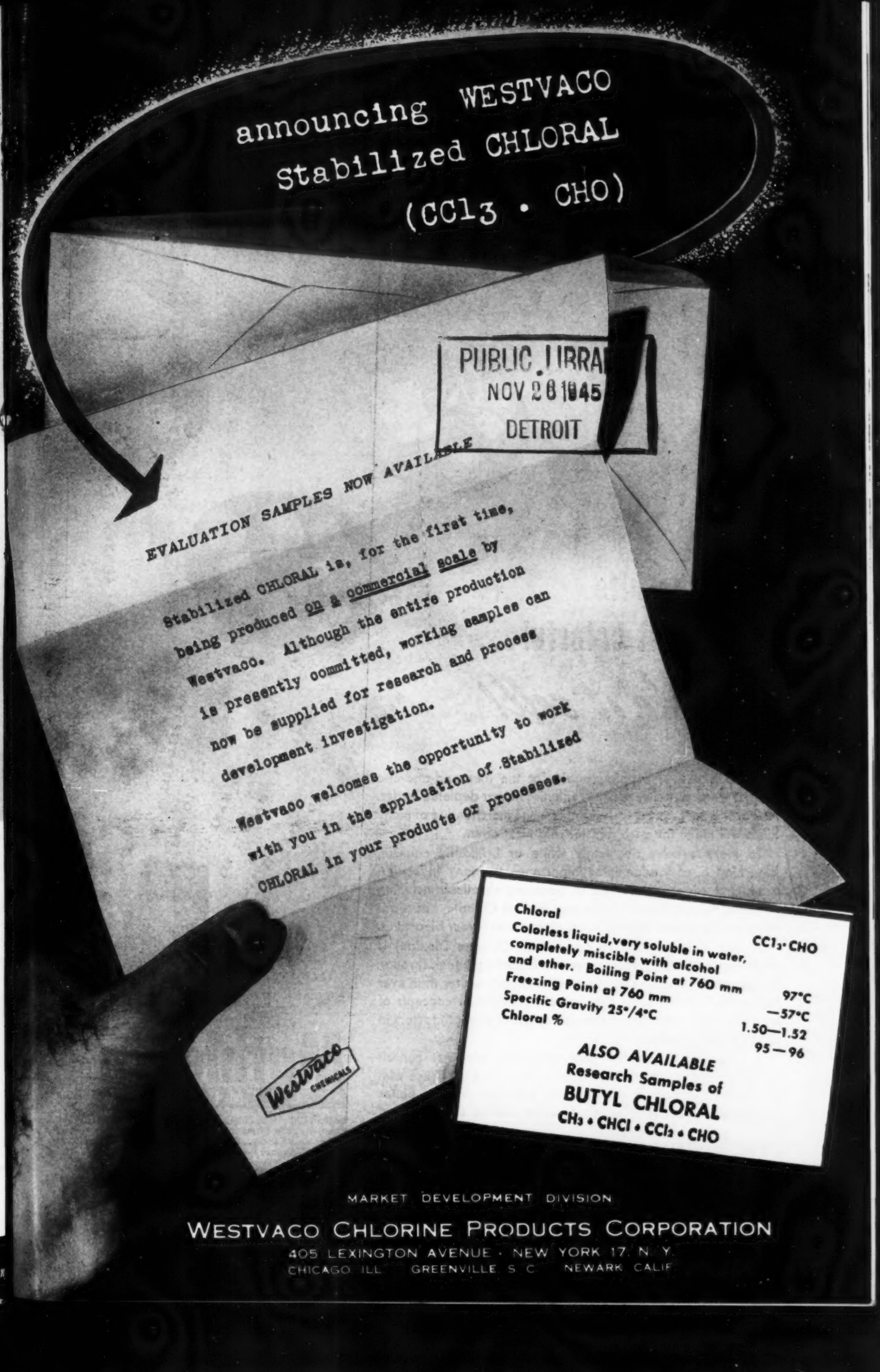
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PIONEERS AND LEADERS IN THE MANUFACTURE OF CHEMICAL BLEACHING AGENTS

THE CHEMICAL BUSINESS MAGAZINE

Chemical Industries

VOLUME 57
NUMBER 5

November 1945 Contents

DEPARTMENTS

NEWS OF THE MONTH

COVER: This phthalic anhydride unit at the St. Louis plant of Monsanto Chemical Co. is now producing for peace instead of war.

PRICE OF THIS ISSUE $1.00

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THE READER WRITES

Canadian Markets

To the Editor of Chemical Industries:

I believe that there is going to be a lot more attention paid to chemical marketing—and market-seeking—in the next few years than has been the case for a long time. Hence my feeling that a number of U. S. producers might like to cast an eye of appraisal at the Canadian market. It has often struck me as odd that although a large number of U. S. producers think nothing of manufacturing in New York and shipping to Chicago or San Francisco, these same producers often shy away from export as being an "involved" business, even though the Canadian markets in Toronto and Montreal are closer than much of their domestic market.

I realize, of course, that such Canadian markets, considering the total dollar volume, are often so small as not to warrant maintenance of office, warehouse, etc., but nevertheless a number of U. S. producers I know do a lush, solid business here via their own offices (no warehouse) or by means of agency arrangements.

CANADIAN READER
Toronto, Ont.

Literature Correlation Needed

To the Editor of Chemical Industries:

Dr. Bush's report, "Science—The Endless Frontier," treats implicitly with a feature of scientific research which I venture to suggest could have been usefully more explicit and emphatic. It is the stupendous problem of the scientific literature.

The proliferation of the printed record of scientific research has made necessary certain important tools by which the research worker can inform himself with some confidence about the work which has been done in his field. These tools have consisted of various compendia, encyclopedic in character for the areas covered, current abstracts, and reviews and tabular data either critically or uncritically compiled. The Germans were especially diligent and competent in performing this essential but tedious service.

Since World War I this work has lagged until now most of these compendia are woefully out of date. Abstracting services have never been entirely comprehensive in respect of a specific discipline. The abstracts of the American Chemical Society most nearly approach this ideal within that discipline. Obviously these essential tools should have world-wide coverage; consequently the problem becomes international in its scope.

The situation is now very serious. Research workers are more and more handicapped in their current work. No scientific society is financially able adequately to serve its members. It is doubtful that any private enterprise is able to serve its own research workers adequately. Therefore, it seems logical that government is the only agency through which these urgent needs can be supplied. The international character of the problem also supports this view.

It has been suggested that because of their demonstrated ability and past accomplishment in this field, the scientific personnel of Germany could be put to work usefully on such a project.

FREDERIC W. WILLARD, President
Nassau Smelting & Refining Co.
New York, N. Y.

Litharge-Glycerin Cements

To the Editor of Chemical Industries:

In your June, 1945, issue we notice a letter from C. S. Treacy, chemical engineer, 315 Heathcote Road, Scarsdale, N. Y., in which he mentions the effect of water on the setting rate of litharge-glycerin cements.

In this connection, the data in the enclosed table may be of interest to you and your readers.

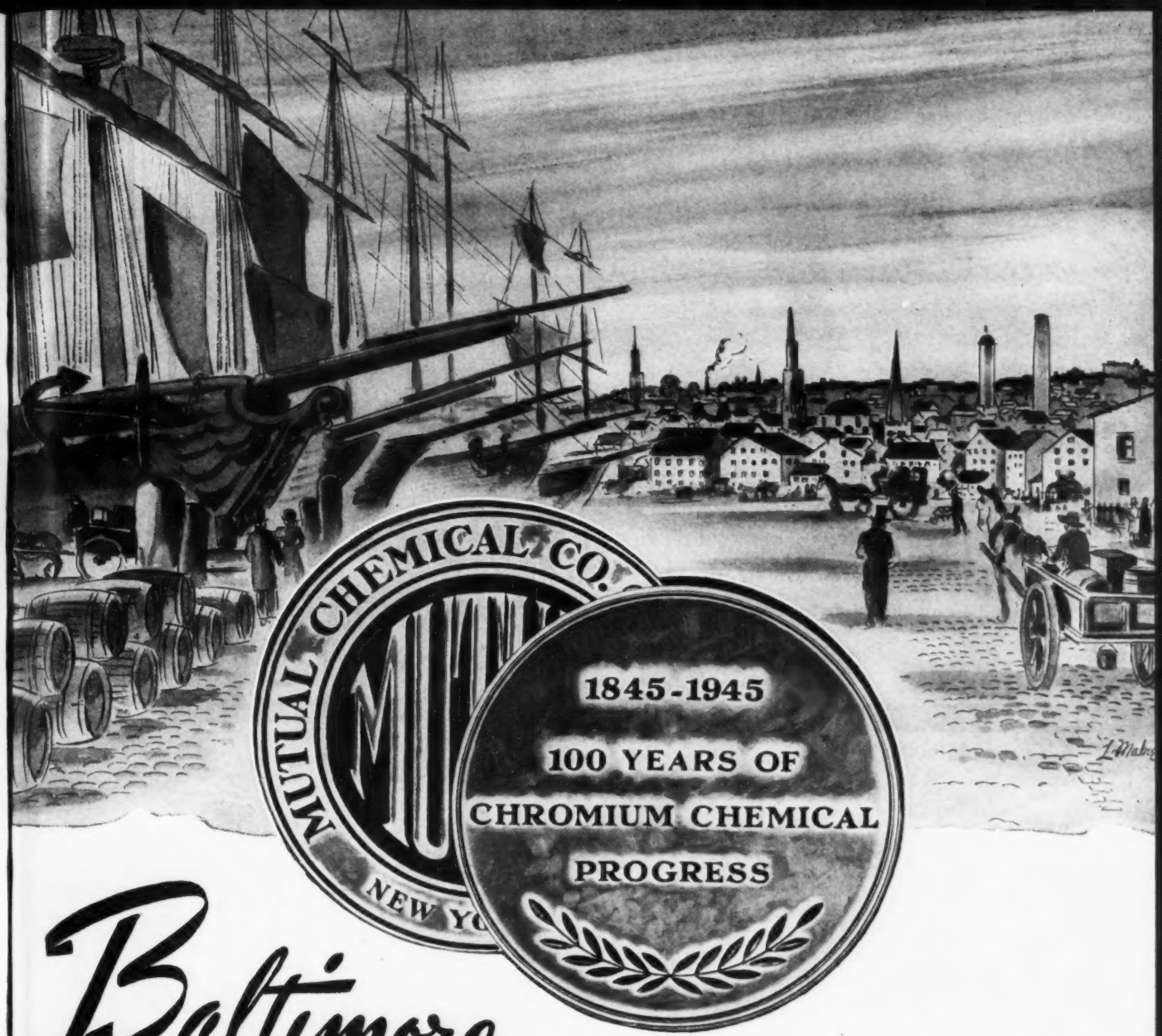
ROBERT L. ZIEGFELD, Asst. Secy.
Lead Industries Association
420 Lexington Ave.
New York 17, N. Y.

See table below.—Editor.

EXPERIMENTAL DATA ON LITHARGE-GLYCERINE CEMENTS

(One pound mixes were made in all tests)

Formula	*No. 1 100 cc. glycerin*	*No. 2 90 cc. glycerin*	*No. 3 80 cc. glycerin*	*No. 4 80 cc. glycerin 20 cc. water*	*No. 5 83 cc glycerin 17 cc. water*	*No. 6 86 cc. glycerin 17 cc water*	*No. 7 140 cc. glycol*	*No. 8 90 cc. of 5:2 solut. glycol water*	*No. 9 100 cc. of 5:2 solut. glycol water*
Room temperature, °F	65	67	70	68	69	67	70	68	70
Pouring time, hrs.: min.	1:19	0:40	0:19	0:5.5	0:6	0:8	0:4	0:6	0:5
Setting time, hrs.: min.	3:48	1:50	0:43	0:15.5	0:16.5	0:18	10:0	0:17	0:11.5
Maximum temp., °F.	119	127	129	126	137	132	113	115	122
Paste condition	Fairly viscous	Fairly viscous	Very viscous	Fairly liquid	Fairly liquid	Fairly liquid	Liquid	Fairly liquid	Fairly liquid
Tensile strength of briquettes 4 months after being made, lbs.	626	668	662	411	402	394	none	243	281



Baltimore

THE BIRTHPLACE OF AMERICAN CHROME

One hundred years ago when the predominating features of the sky line of Baltimore were many masts and a few steeples, the foundations for the present Mutual Chemical Company of America were being laid there by Isaac Tyson, who built the first chromium chemical plant in this country. This plant, together with other plants built later by Mutual in other locations, freed our country from the necessity of relying upon foreign sources of supply. As the economy of the country expanded so did knowledge about the uses of chromium chemicals so that in times of peace they are not only essential to many of our most important process industries, but proved invaluable in the war effort. While they are less spectacular than tanks, guns, planes, and similar items of armament, many modern weapons of this kind could not have been made without them.

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F A M O U S

Caustic Comments

In the course of conversation at a cocktail party, a tactless woman remarked to the late Alexander Woollcott, "I don't like you . . . I simply cannot bear nitwits."

"You are not at all like your mother, are you?" was Woollcott's caustic rejoinder.

WASHINGTON

T. N. SANDIFER *reporting*

Aluminum Plant Disposal Hearings . . . Export Outlook . . . Gas Hearings Oil and Gas Developments . . . Pending Legislation

Decision on Aluminum Plant Disposal Will Test Government Policy

HINTS FROM THE Attorney General's office that his department is tending toward a more moderate anti-trust policy with respect to certain industry conditions are not reflected in the general atmosphere here.

The report of the Kilgore subcommittee was filled with suspicion that German chemical interests were being babied by our occupation authorities, and warned against any policy that would permit revival of this German industry, with particular reference to the supposed cartel affiliations with major American chemical organizations.

Hearings were started as this issue went to press, on a proposal by the Surplus Property Administration for a Government-aided aluminum industry that would compete with the established Aluminum Company of America and affiliated companies, or other older units of this industry.

The Government ended the war owning 52 plants and related facilities or equipment. The Surplus Property Board report advocates a disposal policy to "foster development of a competitive aluminum industry" and reports that six corporations, in addition to Alcoa, have indicated interest in acquiring these plants or leasing them.

Surplus Property Administrator W. Stuart Symington, who submitted the report, was scheduled as an early witness before the Surplus Property subcommittee of the Senate Military Affairs Committee, as might be expected.

Also scheduled to appear was Attorney General Tom Clark, who had likewise submitted a report to the committee on the aluminum industry. He recommended dissolution of the Aluminum Company of America.

The SPB Administrator's report was submitted under a section of the Surplus Property Act which prohibits selling or leasing for more than 5 years any aluminum plant which cost the Government more than $5,000,000, until 30 days after submission to Congress of the disposal program for such plants. Hearings are being held on the proposed disposition of the plants both pursuant to this requirement and in the light of a powerful sentiment for some public use of the plants.

Representatives of the Department of Interior, Department of State, TVA, Smaller War Plants Corporation, and others whose policies will affect the postwar aluminum industry also were to appear

Foreign Sales Outlook

GREATER SALES PROMOTION ACTIVITY by U. S. manufacturers and exporters could most probably increase this country's share of the world trade in chemicals in the postwar period, according to the Chemical Unit of the Department of Commerce.

Germany probably will not regain its prominent place as an exporter of chemicals, the department reported, at least for some time, but other foreign countries will have expanded output in some lines and newer industrial countries may produce chemicals competitive with United States products.

Postwar chemical exports from this country could be expanded substantially if only increases are shown for a part of many inorganic chemicals, it was stated.

Federal Power Commission Gas Hearings

A HIGHLIGHT OF THE Federal Power Commission's investigation of the natural gas industry, which opened at Kansas City late in September, was the statement by Dr. E. DeGolyer, geologist, of Dallas, Tex., testifying for the natural gas industry committee, that the proved U. S. natural gas reserves are in excess of 140 trillion cubic feet. Asked how long this much gas would last the country, he estimated it would require 43 years to exhaust the known Texas reserves, 74 years for Kansas, 19 years to use Oklahoma's reserve, and nearly 28 years to exhaust the Louisiana reserve. He stressed, however, the possibility of new discoveries of gas, which, he indicated, were promising.

Oil and Gas Developments

THE CURRENT ISSUE IN CONGRESS over State versus Federal control of gas and oil deposits in submerged areas within the 3-mile coastal limits was not affected by the Presidential proclamation of Federal sover-

eignty over mineral deposits in the so-called "continental shelf" beneath the continent's boundary waters.

A bill, H. J. Res. 225, already has been approved in the House, waiving Federal claim to oil, gas and other mineral deposits within the old 3-mile limit. This bill is scheduled to be heard before a Senate committee in mid-November. While the Interior Department is known to oppose the bill, it is being very careful.

Parenthetically, Interior officials are reportedly not in a position to be very aggressive about any touchy issue. There was some official sentiment in the Department favoring the proposition to share the atomic bomb secret with our friends everywhere. First the Army and Navy, then the Administration, scotched this idea, and those who went out on this limb are not anxious to get out on any more.

The hearings so far in the Federal Power Commission's investigation of the natural gas industry have tended to emphasize the State-vs.-Federal issue, with the testimony preponderantly opposing FPC expansion into the regulatory field of either production or end-use of natural gas. Sentiment as reflected here appears to favor joint State action rather than Federal on such issues as the proposals to restrict wasteful end-uses of natural gas.

Legislative Check-Up

NATIONAL RESEARCH BOARD BILL, S. 825, by Senator Byrd, is pending in Senate Naval Affairs Committee, with no action scheduled; a number of patent bills, H. R. 2630, 2631, and 2632, by Representative Boykin, providing for public registration and other changes in patent laws, have gone through the hearing stage before a House committee, but no immediate action appears likely; the same applies to H. R. 2111, also introduced by Rep. Boykin, to provide for registration and claims procedure on foreign patents.

The House Patents Committee, on the other hand, has scheduled extensive hearings on the Bailey bill, H. R. 2612, to establish regulations applying on contracts between American and foreign interests involving the use of American patents, where prices, production and sales quotas are fixed. (Anti-monopoly.)

The National Fertilizer Policy Bills, S. 882 and H. R. 2922, are pending, and are being vigorously opposed by the National Fertilizer Association on the ground that it proposes to establish a ruinous competitive situation for private industry.

The public interest in atomic potentialities has put a new aspect on all legislation dealing with Government-fostered research and kindred fields. Several bills in this category are pending.

Hearings have been in progress on the Kilgore-Pepper, Magnuson and Fullbright bills for a National Science Foundation. Chairman J. S. Hunsaker, of the National Advisory Committee for Aeronautics and an internationally recognized scientist, testified in favor of a board to administer the functions proposed in the bill, which body could select its own chief. This idea is opposed in other quarters. The Director of the Budget thinks a one-man direction would be best, doubtless he views the matter as an administrative problem primarily. Dr. Hunsaker, however, said he was speaking from experience at the NACA, in urging a board.

Late-comer to the legislation in this field is the Vinson bill, H. R. 4317, to establish an Office of Naval Research in the Navy Department. The purpose is to provide within the department a single office to serve other bureaus of the Navy with world-wide scientific data, and conduct specialized "and imaginative research," aided by an advisory committee of recognized scientific and research men.

An Atomic Control Board is contemplated to insure a Government monopoly and protect the secrecy of all atomic energy research, which, however, would be empowered to pass such of its findings on to public use as might be considered advisable. The Board may be established as a part of the Federal Water Power Act. The Johnson-May bill, S. 1463 and H. R. 4280, calls for a 9-member commission, to be appointed by the President, and is understood to have his endorsement.

Instruments and Chemical Materials Released from Price Control

THE OFFICE OF PRICE ADMINISTRATION has suspended from price control chemical stoneware, talc, ground soapstone and pyrophyllite, also as part of the same general action, industrial instruments used in measuring and control of physical and chemical variables in industrial processes were exempted.

No particular explanation was given for exempting these materials. In the case of the instruments, it was pointed out that many technological advances have been made in the war so that much of the forthcoming production will be on new types for which no comparable price data exists. However, the OPA continued, there is a competitive situation in the industry which is expected to check any undue price reactions from the present exemption.

Reorganization of Government Agency Set-Up Debated

THE HOUSE HAS BEEN CONSIDERING a bill, H. R. 4129, to subject the Federal Power Commission and other commissions and bureaus now exempt to the general reorganization which the President has asked Congress to authorize. The President's request, embodied in S. 1120, has been in the Senate Judiciary Committee, where the fight appeared largely centered on the question of exempting or not exempting certain regulatory bodies from the possibility of reorganization.

Admittedly the number of independent quasi-judicial bureaus and commissions now operating in Washington is irritating to a large element of Congress, which wants them lined up in some better order than

Commonplace Essentials loom large among materials on which many modern advances in chemical synthesis depend. Caustic soda, one of the most familiar faces in the chemical family, is typical. For "NaOH" serves in the processing of rayon yarns for fine fabrics, soaps, refined petroleum and vegetable oils, paper making, and in rubber reclamation. Thorough knowledge of such widely used "Commonplace Essentials"... is combined with Niagara's recognized preeminent standards of manufacture to provide users with the dependable source of supply they need.

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at present. The agencies, naturally, would prefer to remain as they are, and have objected even to certain accounting requirements to which regular departments are subject. The agencies base their case on the necessity to remain independent of political control.

Chemical Allocations in War Measured in Billions

THE CHEMICALS BUREAU OF WAR PRODUCTION BOARD directed allocation of approximately $10 billion worth of chemicals in the past four years, to meet vital wartime needs for munitions, medicinals, insecticides and other highly essential military and civilian requirements. Production of chemicals and allied products in the period from 1942 through 1944 was approximately $21.7 billion, War Production Board has reported.

Chemical plant expansion cost approximately $4,000,000,000, in Federal and private money.

Production of DDT and the penicillin programs were cited as outstanding in the wartime chemical output. Industrial alcohol production was likewise a major feature of the chemical expansion.

The record allocation of chemicals for the war was in the first quarter of 1945, totaling over $1,000,000,000, according to WPB.

Included in chemicals allocated among the United States, British Empire and United Nations by the Combined Raw Materials Resources Board were pyrethrum, rotenone, shellac, copper sulfate, gum copal, bones, hide glue stock, casein, cotton linters, cinchona bark and rosin. Chemicals made available from abroad through public purchase programs included benzene, cresol, and naphthalene from the United Kingdom; pyrethrum, rotenone and cinchona bark from South America; shellac from India; and nitrates from Chile.

Very few orders affecting chemicals remain in force; rosin and cinchona bark are among them. Until the end of the year, Chairman Krug reports, shortages in special fields, such as chemicals for protective coatings, nicotine, rotenone, and certain insecticides may be expected to continue.

In general, Chairman Krug stated in a semi-final comment, the reconversion problem in the chemical industry is largely one of disposal of surplus capacity and finding new markets. It has been estimated that in the first full postwar year the expected production of chemicals and allied products may be $5,900,000,000 in contrast with $3,700,000,000 in 1939 and $8,300,000,000 in 1944.

Gas Consumers Get Refund

THE FEDERAL POWER COMMISSION HAS ACCEPTED the proposal of Colorado Interstate Gas Company to reduce its wholesale natural gas rates by $2,793,000 annually, and to make a refund to consumers on bills dating from May 20, 1942. The reduction in rates amounts to 41 percent annually, and the rebate totals $8,500,000, which has been accumulating in deposits with a United States Court of Appeals. However, the impounded total is $1,658,000 less than the amount of the refund, and the difference will be made up by a payment by the company, according to the Federal Power Commission.

The lowered rates will apply principally on sale of gas to distribution companies in Colorado, and to two pipeline companies serving Colorado, Wyoming, Nebraska, Iowa, Illinois and Indiana. The Natural Gas Pipeline Company of America, one of those concerned, serves chiefly in Chicago, but also in several other states.

Federal Fertilizer Manufacture Proposed

Federally-owned plants used during the war for processing agricultural commodities, or manufacture of nitrates for fertilizer, would be retained pending a study and report by the Secretary of Agriculture as to the feasibility of using these plants for continued production of nitrates and fertilizer, under a bill by Sen. Butler, S. Res. 176.

Chemical Bureau Change

With the end of October this unit becomes the Chemical Section of the temporary Civilian Production Administration, successor to WPB. Dr. D. P. Morgan, who headed the Chemical Bureau during its most active war service, has remained with the Washington organization supervising its transition and at this writing had not announced his private plans, although it has been known here that he has planned for some time to return to private business as soon as he could be relieved.

He will be succeeded by Lawrence Brown, who has been serving as director of the Office of Chemicals Coordination in the former Bureau.

Missouri Valley and Others

THE STATE-FEDERAL ISSUE IS PRESENTED in a somewhat different light in the case of the various "Authority" proposals now pending. The MVA currently faces some serious reverses in Congress, and not the least of the reasons is the powerful opposition of State elements which have long-established, satisfactory relations with older Federal agencies, and don't care to see some new, untried super-agency in their places.

As certain opposition spokesmen put it this month, if they are dissatisfied with anything as the present set-up operates, they can secure correction in Congress, but with an outside, multi-state "Authority" handling the same matters, they are not so certain who would win.

UNTIL THE END OF THE YEAR shortages in special fields, such as chemicals for protective coatings and certain insecticides, including nicotine and rotenone, may be expected to continue, according to WPB.

Baker's Chemicals . . . .

HELPMATES TO MANY INDUSTRIES

Illustrated are messages to six of the many industries where Baker's Chemicals have played an important role in the development and manufacture of quality products. If you have a product or a process where purity by the ounce or purity by the ton is required, remember the name, J. T. Baker Chemical Co., Phillipsburg, New Jersey.

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PYRIDINE CONTENT: Approximately 98 per cent.

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SPECIFIC GRAVITY: 0.985 to 0.990 at 15.5°C.

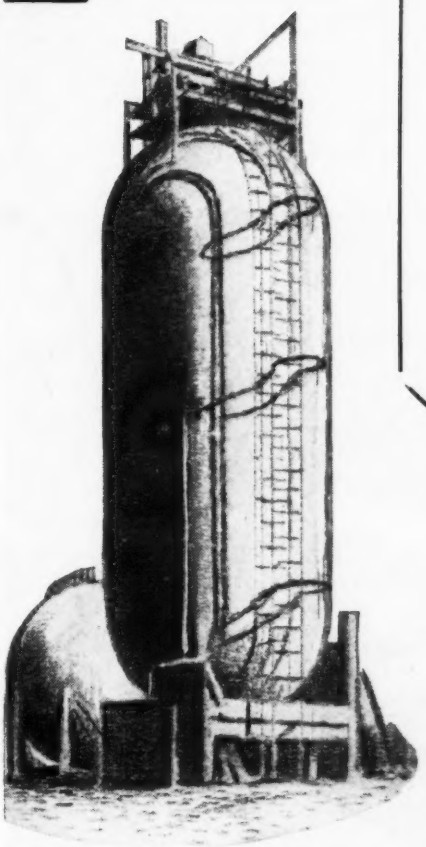
WATER CONTENT: Trace.

COLOR: Water White (Discolors slowly on standing).

SOLUBILITY IN WATER: Complete.

SHIPPING CONTAINERS: Tank cars, 50-gallon drums, and 1-, 5- and 10-gallon cans.

AVAILABILITY: Presently available without allocation.



ARMY E NAVY

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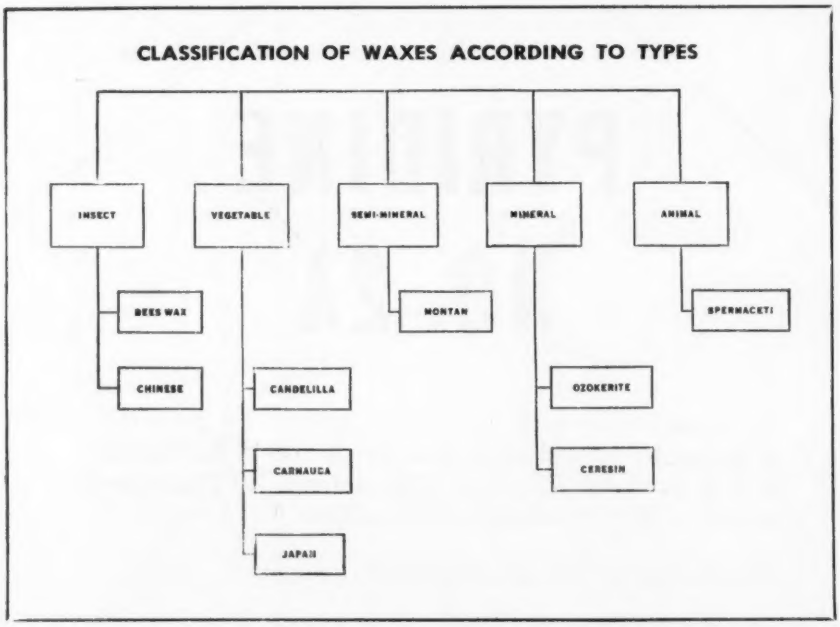
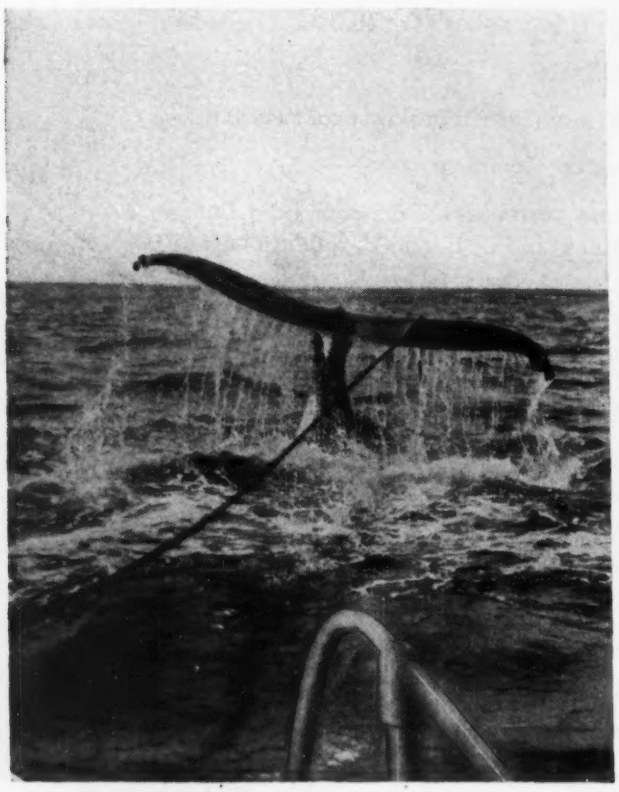


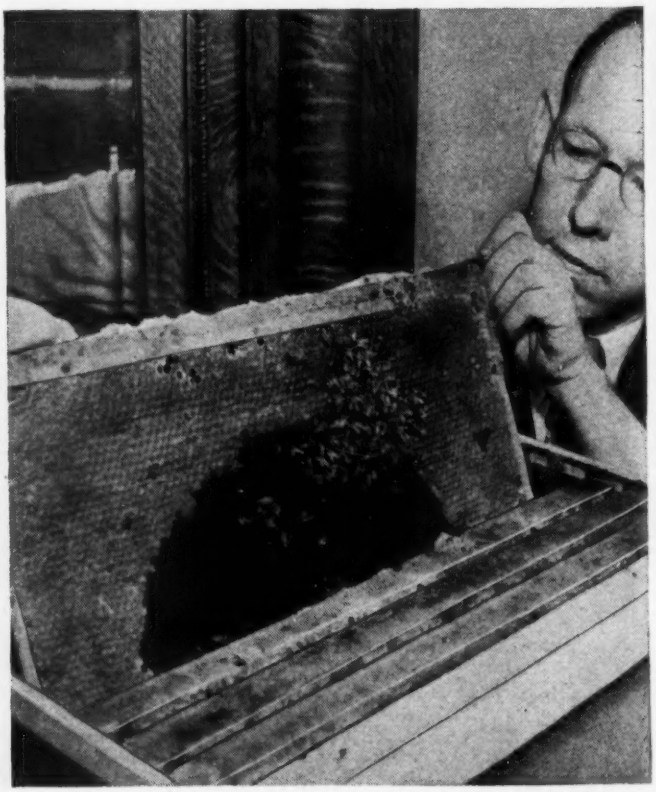
WAXES ARE DERIVED FROM MANY DIVERSIFIED SOURCES

First, are the insect waxes. Beeswax, the framework of the honeycomb, is found all over the world. Chinese Wax comes from western China. The vegetable waxes, include Carnauba, found on the leaves of South American palm trees, Candelilla, which coats the surface of a Mexican plant, and Japan Wax from sumac trees in Japan and China. Montan, derived from lignite, is a semi-mineralized wax. And from the vicinity of some petroleum springs in many parts of the world come the waxes, Ozokerite, a natural bituminous product, and Ceresin, purified Ozokerite. Spermaceti, an animal wax, is obtained from the sperm whale.

Huge quantities of waxes are used as the basic ingredient of polishes for floors, furniture, and automobiles, in the making of waterproof paper and textiles, in cosmetics, soaps, varnishes, adhesives, crayons, phonograph records, ointments, lubricants, and many other products. In addition to supplying crude waxes of many types, Cyanamid research and development are constantly increasing the utility of waxes.

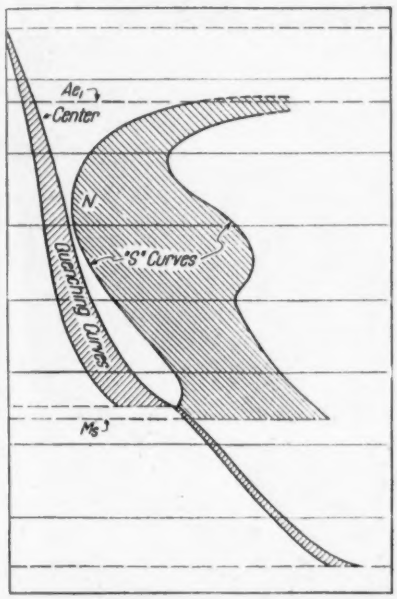


Spermaceti is obtained from refined crude sperm oil taken from the head cavities and blubber of the sperm whale.



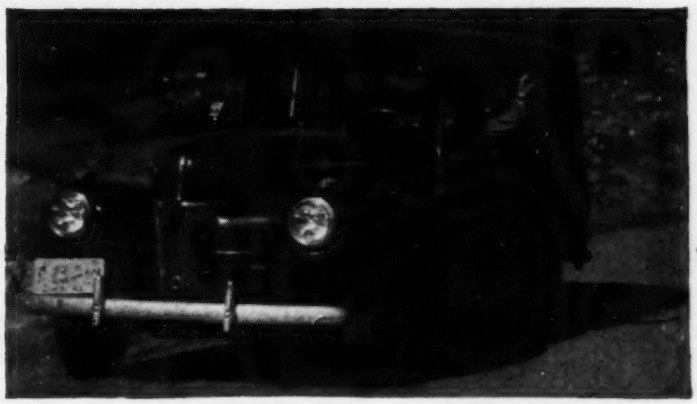
Beeswax, the framework of the honeycomb, is secreted by the common honey bee, and is found all over the world.

Chemical Newsfront



(*Left*) **THE LOCATION OF THE Ms POINT** in isothermal martempering can be kept practically constant by the use of Cyanamid's neutral type salt baths. The effectiveness of these baths is shown by the experience of one manufacturer who was working with SAE 52100 steel. It was important that the Ms point be located as nearly permanently as possible in order to secure reproductive results on a production run. Decarburization was occurring, resulting in the Ms point locating itself over a range of 150°F. When Cyanamid's AEROHEAT** 1200 was used, the carbon content of the steel surface remained unchanged. Cyanamid's complete range of AEROHEAT non-decarburizing, heat-treating, salt baths, and AEROCASE*, AEROCARB*, AEROCARB DEEPCASE, and Sodium Cyanide baths, assures dependable carburizing and heat-treating.

(*Below*) **TODAY THERE'S NEW STRENGTH IN WOOD PRODUCTS** when they're bonded with URAC* resin adhesives, especially developed by the Plastics Division of Cyanamid for wood-working processes where it may be difficult to apply sufficient pressure for a uniformly thin glue line. URAC 185, a low-pressure, cold-setting assembly cement that retains its strength in glue line thicknesses up to .020″ is particularly applicable for furniture making and cabinet work, musical instruments, bows, tennis racquets, fishing rods, and other sporting goods. It assures safety, economy, and speed of operation in the manufacture of wooden assemblies for station wagons, truck bodies, and heavy timber laminations.



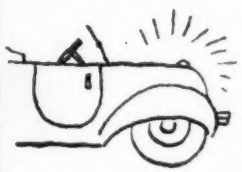
*Reg. U. S. Pat. Off. **Trade-mark

METHYL ISOBUTYL KETONE

$CH_3-\overset{O}{\overset{\|}{C}}-CH_2-\overset{CH_3}{\overset{|}{C}}H-CH_3$

Molecular Weight 100.16

High boiling point, low cost, no hydrolitic reaction, and good stability during storage, make Methyl Isobutyl Ketone a desirable solvent for cellulose esters and vinyl resins.



MIBK is used extensively in nitrocellulose lacquers for automobile finishes and other lacquer applications including emulsion and hot spray types.

With vinyl resins, MIBK is used to formulate lacquer emulsions for paper-coatings, textiles, and leathers.

MIBK's solvent properties are particularly useful in the manufacture of shoe cements . . . as an extractive agent in the manufacture of drugs — penicillin, tannic acid, etc.

In addition to its many other industrial uses, Methyl Isobutyl Ketone is authorized as a denaturant for ethyl alcohol in anti-freeze and general solvent purposes.

Does MIBK possess qualities useful in your plant process?

SPECIFICATIONS

Purity	Minimum 99% methyl isobutyl ketone by weight
Specific Gravity 20°/20° C.	0.800 to 0.804
Color	Maximum 15 platinum cobalt (Hazen) standard
Water	Miscible without turbidity with 19 volumes of 60° Bé. gasoline at 20° C.
Acidity (other than carbon dioxide)	Maximum 0.01% calculated as acetic acid
Distillation Range (A.S.T.M. D268/33)	Below 114° C. None Above 117° C. None
Weight	6.68 lbs. per gallon at 20° C. (approx.)

PHYSICAL PROPERTIES

Several of the physical properties of methyl isobutyl ketone are given in the following table:

Specific Gravity at 20°/4° C.	0.8004
Boiling Point at 760 mm.	115.9° C.
Melting Point	−83.5° C.
Flash Point, Tag Open Cup	81° F.
Tag Closed Cup	64° F.
Vapor Pressure at 20° C.	15.2 mm. Hg.
30° C.	26.2 " "
40° C.	43.5 " "
Specific Heat	0.46 (20° C.)
Refractive Index, N_D^{20}	1.3958
Coefficient of Expansion	0.000625 per °F.
Latent Heat of Vaporization	87 gm. cal. per gm.

Azeotropic Data: Methyl isobutyl ketone forms a constant boiling mixture with water, containing 75.7% by weight of methyl isobutyl ketone and boiling at 87.9° C.

For further properties and uses communicate with either of the addresses below.

SHELL CHEMICAL Division of SHELL UNION OIL CORPORATION
100 BUSH ST., SAN FRANCISCO 6, CALIFORNIA

R.W. GREEFF & CO. *Eastern Sales Agent* 10 ROCKEFELLER PLAZA, NEW YORK 20. TRIBUNE TOWER, CHICAGO 11

The NITROPARAFFINS

. . . . solvents that offer a short cut to better products *and simplified chemical processes*

POWERFUL For many substances the NP's are the most powerful solvents known. For others the NP's are the *only* mild-odored, medium-boiling solvents. Examination of the solubility table will indicate in a general way the fields where the Nitroparaffins are known to be applicable.

SELECTIVE The NP's are highly selective solvents . . . for example, they may be used to separate aromatic and paraffinic hydrocarbons. This characteristic suggests their usefulness in numerous extraction, purification, and recovery processes.

S RAW MATERIALS FOR SYNTHESES, the NP's have already become the source of many valuable new compounds. Yet their versatility and high reactivity indicate that further exploration will uncover vastly greater opportunities.

Have you investigated the Nitroparaffins? There are four in commercial production: Nitromethane, Nitroethane, 1-Nitropropane, and 2-Nitropropane. If you do not have a copy of our booklet describing the properties and uses of the NP's and their more important derivatives, send for a copy today.

COMMERCIAL SOLVENTS
Corporation
17 East 42nd Street, New York 17, N. Y.

TABLE OF Solubilities in 1- and 2-Nitropropane

YES Substances soluble in 1- and 2-Nitropropane to the extent of at least 10 g 100 ml. EXCEPTIONS: Substances indicated (SS) are only slightly soluble—less than 10 g 100 ml. Substances indicated (SA) are soluble in the presence of alcohols.

Synthetic Resins
Aroclor 4465
Aroclor 5460
Bakelite XR-9366
Beckacite 1001
Beckacite 1112
Cumar
Durez 500
Ester gum
Glyptal 2471
Paraplex 5B
Rezyl 14
Santolite MHP
Teglac 65

Oils and Fats
Castor oil
Cocoanut oil
Kerosene
Lanolin (SS)
Pine oil
Soya bean oil

Organic Chemicals
Acrylonitrile
Aminomethylpropanol
Aniline
Benzaldehyde
Benzoyl chloride
Camphor
o-Chloraniline
Chloroform
Diethylene glycol
Dibutylamine
Ethylene chlorohydrin
Glycerol
Isobornyl acetate
Lauric acid
Maleic anhydride
Naphthalene
p-Nitroaniline
Oleic acid
p-Phenylenediamine
Pyridine
Salicylic acid
Terpineol
Triphenyl phosphate

Coating Materials
Acryloid C-10
Benzyl cellulose
Cellulose acetate (SA)
Cellulose acetate butyrate
Cellulose acetate propionate
Cellulose triacetate
Ethyl cellulose
Hycar OR
Nitrocellulose
Uformite
Vinylite VYHH

NO **Substances insoluble in 1- and 2-Nitropropane**

Organic Chemicals
Adipic acid
Aluminum stearate
Aminobenzoic acid
Citric acid
Ethylene glycol
Fumaric acid
Glycine
Hexamethyleneamine
Hydroquinone
Oxalic acid
Stearic acid
Succinic acid
Sucrose
Tartaric acid
Triethanolamine
Urea
Zinc stearate

Coating Materials
Butyl rubber
Casein
Dextrin
Gelatin
Neoprene
Vinylite VYNW
Zein

Waxes
Beeswax
Candelilla
Montan
Paraffin

Properties of CSC Nitroparaffins	Nitromethane	Nitroethane	1-Nitropropane	2-Nitropropane
FORMULA	CH_3NO_2	$CH_3CH_2NO_2$	$CH_3CH_2CH_2NO_2$	$CH_3CHNO_2CH_3$
Molecular Weight	61.04	75.07	89.09	89.09
Specific Gravity at 20/20 C	1.139	1.052	1.003	0.992
Pounds per U. S. Gallon at 20 C	9.48	8.75	8.35	8.24
Melting Point, C	-29	-90	-108	-93
Boiling Point, C	101.2	114.0	131.6	120.3
Flash Point, F (Tag open cup)	112	106	120	103
Vapor Pressure, mm at 20 C	27.8	15.6	7.5	12.9
Surface Tension, dynes per cm at 20 C	37.0	31.3	30.0	30.0
Refractive Index at 20 C	1.3818	1.3916	1.4015	1.3941
pH 0.01 M Aqueous Solution at 25 C	6.4	6.0	6.0	6.2
Rate of Evaporation, by wt (n-Butyl Acetate = 100)	180	145	100	124
Solubility at 20 C				
ml Solvent in 100 ml Water	9.5	4.5	1.4	1.7
ml Water in 100 ml Solvent	2.2	0.9	0.5	0.6

INVESTIGATE THESE NEW

Plasticizers

By

AMECCO CHEMICALS

For

HIGH PLASTICIZING ACTION
LOW VOLATILITY at 250° F.
EXTREME LOW TEMPERATURE FLEXIBILITY

Of Particular Interest for

VINYL RESINS
NEOPRENE
BUNA S
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Write for Descriptive Technical Bulletin giving further information on the uses of these four new plasticizers.

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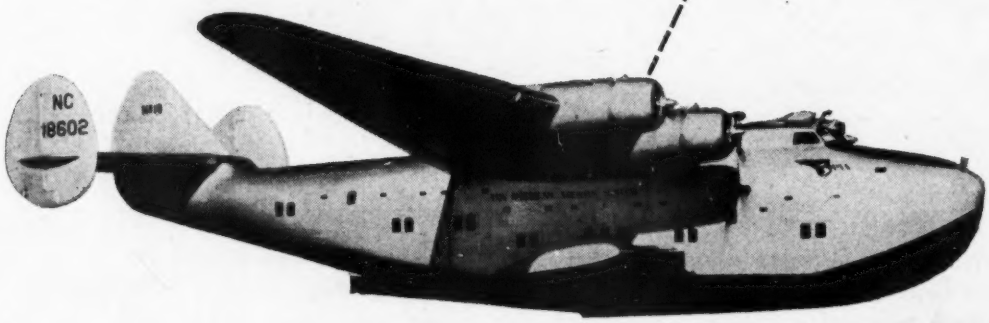
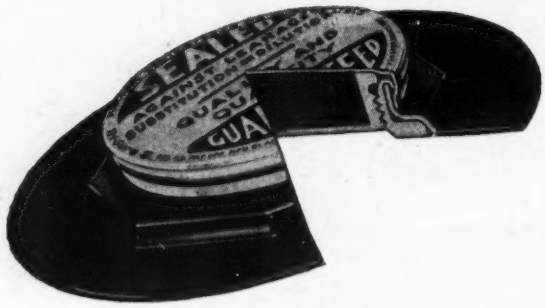
ESTABLISHED 1919

KNOW WHAT'S **INSIDE**



—if you want to know the worth of a **plane**



. . . or a **drum closure**

The Inside Story of The Tri-Sure Closure

The protection which Tri-Sure Closures give to drums is based on the principle of an interlocking *flange*, *plug* and *seal*.

The *flange* is an integral part of the drumhead. The drum stock forms an octagonal seat, with a neck which interlocks with the neck of the flange. The flange gasket, tightly compressed between flange and drum stock, gives positive protection against leakage. As the flange is flush with the inside of the drumhead, complete drainage is assured.

The *plug* is inserted in the flange so that its gasket is confined on all sides. This gasket fits tightly between the plug and flange, and seals the plug hermetically.

The *seal* has a collar which fits so closely to the drum stock that it cannot be pried off without completely destroying the seal. On the inside of the seal is a fixed compressed cork gasket, which prevents the intake of moisture and serves as an additional sealing.

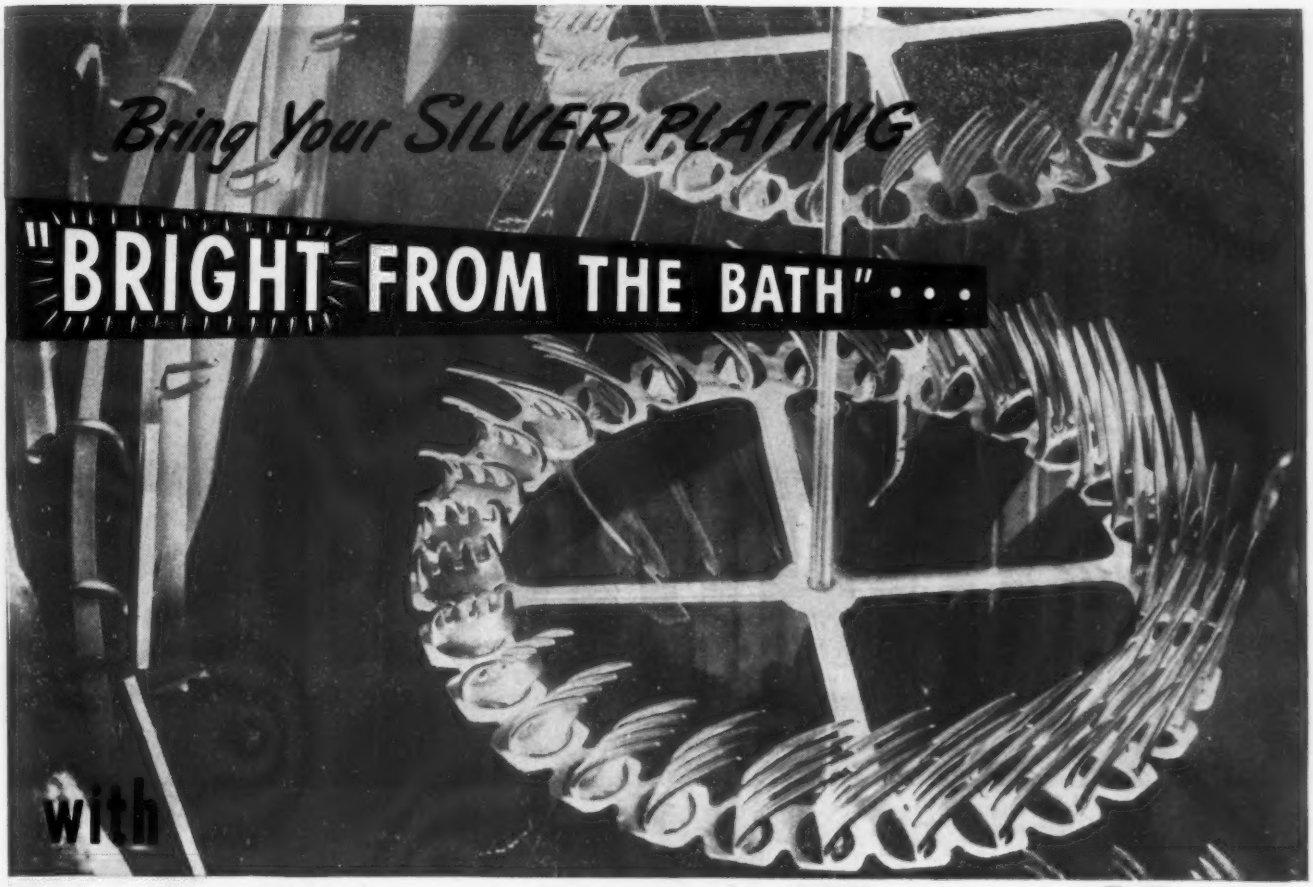
YOU can't tell much about the power of a modern airliner from the *outside*. But let an aviation engineer look *inside* the motors and he will know what kind of performance that plane can give.

You can't tell much, either, about a drum closure from the *outside*. It's the *inside* that counts — the *construction* that must be depended upon to do the vital job of protecting liquid products in transit.

The cut-out view above gives you the "inside" story of the Tri-Sure Closure. It tells *why* there is no substitute for Tri-Sure as a safeguard for protecting valuable liquids from pilferage, leakage, seepage. It tells *why* it always pays to specify "*Tri-Sure fitted drums.*"

Tri-Sure
Reg. U. S. Pat. Off.
CLOSURES

AMERICAN FLANGE & MANUFACTURING CO. INC., 30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.
TRI-SURE PRODUCTS LIMITED, ST. CATHARINES, ONTARIO, CANADA



B&A Ammonium Thiosulfate

(60% Solution, Technical)

NON-VOLATILE

NON-INFLAMMABLE

READILY SOLUBLE

Whether you plate tableware, jewelry or airplane bearings, you can bring your product "bright from the bath" by the addition of Baker & Adamson Ammonium Thiosulfate. When used in silver cyanide plating, this B&A purity product changes the appearance of the plate from the normally dull or matte deposit *to a bright, smooth finish.* Subsequent buffing, burnishing or polishing operations are reduced to a minimum, with attendant savings.

B&A Ammonium Thiosulfate Solution is a clear, colorless liquid virtually free of metal impurities. Unlike ordinary brighteners for silver plating, it is *non-volatile and non-inflammable. It is soluble,* too . . . no delays for messy mixing; just add it directly to the bath.

Leading manufacturers of silverware are already enjoying the advantages of B&A Ammonium Thiosulfate Solution in their operations. Why don't you? For full information, write or call the nearest Sales and Technical Service Office below. No obligation, of course.

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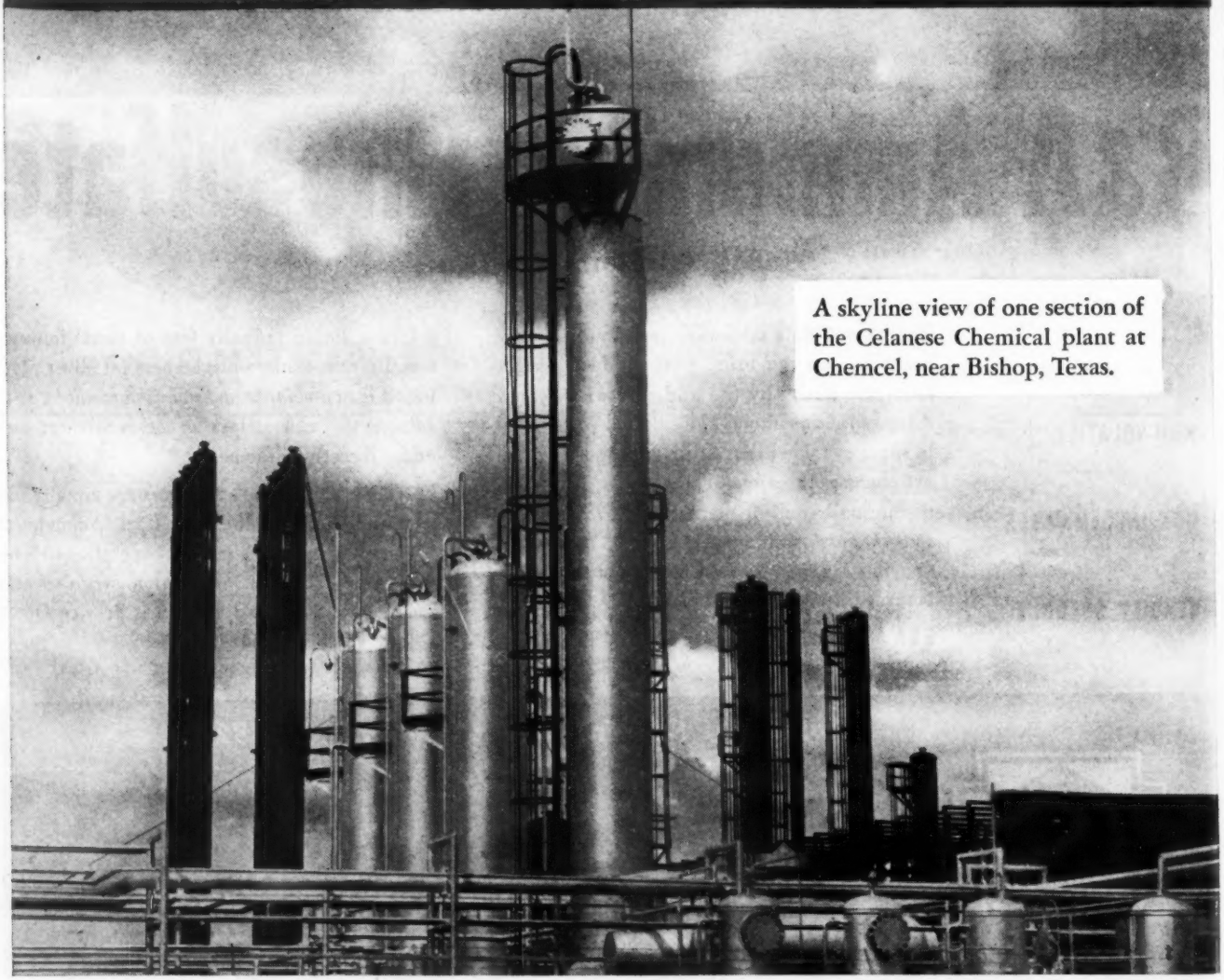
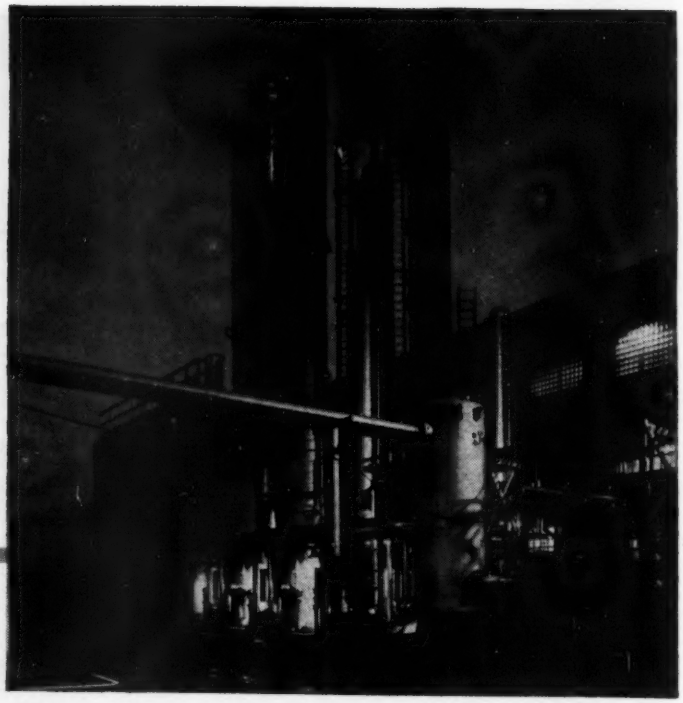
Celanese Chemicals



A skyline view of one section of the Celanese Chemical plant at Chemcel, near Bishop, Texas.

CELANESE CORPORATION OF AMERICA



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Phthalic anhydride. Phenol. Formaldehyde. Acetic acid. Acetic anhydride. Alcohols and synthetic solvents. Beverage alcohol. Nitroparaffines and chlorinated hydrocarbons. Esters and phthalates. Ethers and ketones. Butadiene. Toluene. Explosives and smokeless powder. By-product coke chemicals. Fatty acids. Penicillin. Synthetic chemicals and other products of current chemical research and development.

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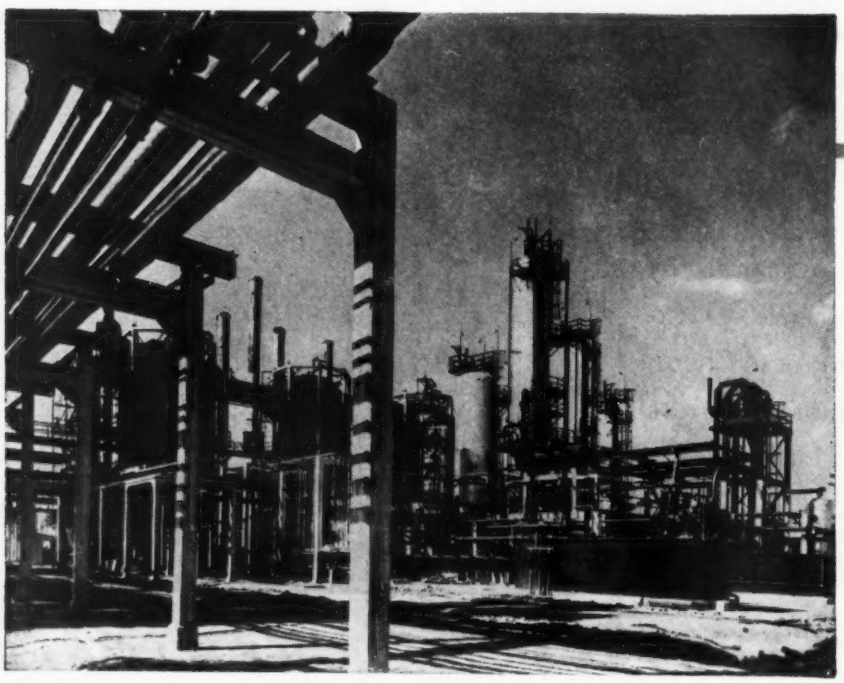

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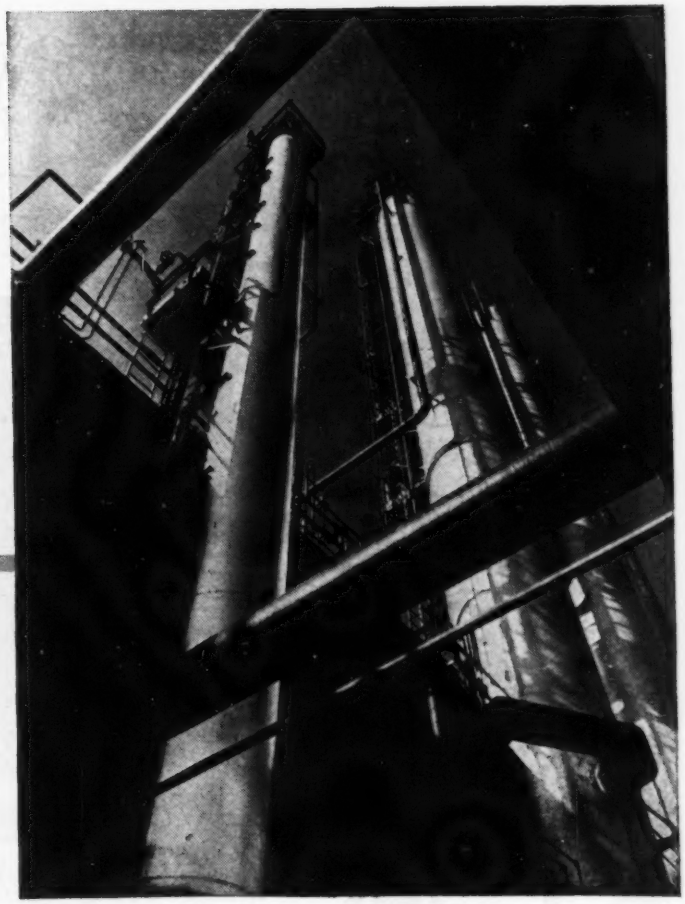

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Atmospheric distillation units. Vacuum distillation units. Superfractionators. Thermofor catalytic cracking units. Houdry fixed bed catalytic cracking units. SO_2 solvent refining units. Furfural solvent refining units. MEK dewaxing units. Extractive distillation. Filtrol fractionation. Thermal reformers, crackers, vis-breakers and cokers. And many others.

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***For Lubricating Oils*—Vacuum distillation. Solvent extraction and dewaxing. Clay treatment, viscosity blending and additive adding equipment. Packaging plants.**

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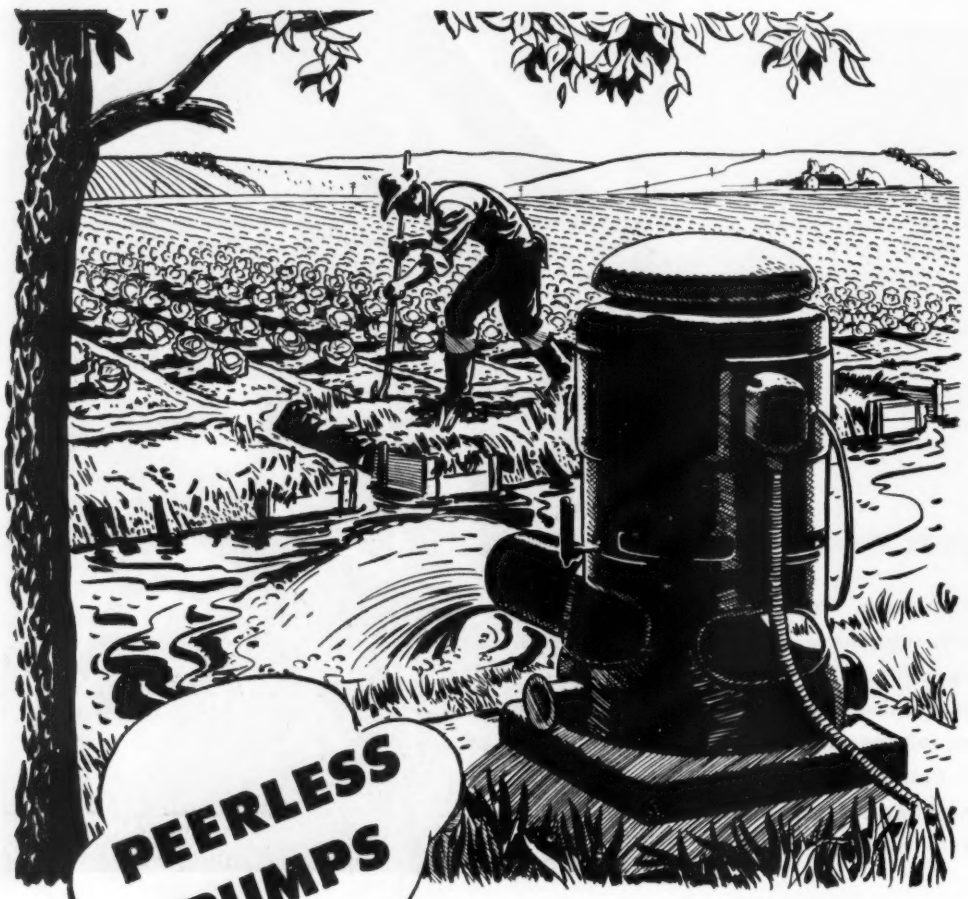

PEERLESS PUMPS

...Reflect over 60 Years of FMC Research & Engineering

Wherever water is pumped throughout the world, the name "Peerless" is familiar to ranchers, farmers, municipal and industrial plant engineers, and many others. To them, "Peerless" means pumps—Turbine, Hi-Lift, Hydro-Foil, and Centrifugal—whose advanced design, superb engineering, and mechanical perfection assure more years of trouble-free, efficient, and economical service. To them, there is no pump like a Peerless, with its many outstanding features—practically indistructible bearings and die-cast rotors, automatic lubricators assuring positive and uniform oil feed, dynamically balanced impellers preventing overload, and many others.

Such a reputation is understandable when you consider that Peerless Pumps are products of a company which has pioneered in original research and engineering since 1883. With the country's foremost research men and pump engineers, the most modern pump testing laboratories, and more than sixty years of experience to draw upon, Food Machinery Corporation will *keep* the name "Peerless" first in pumps.

Peerless Pumps are made by FMC's Peerless Pump Division, with factories at Los Angeles and Fresno, California; Canton, Ohio; and Quincy, Illinois.

FOOD MACHINERY CORPORATION

FMC FOOD MACHINERY CORPORATION

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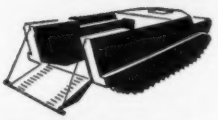
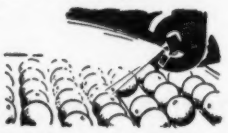
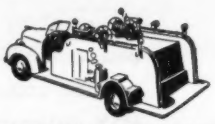
Other Products of FMC Research and Engineering



THE "WATER BUFFALO" amphibious tractor hauls cargo on water and over the roughest terrain where no other vehicle can go.



FLAVORSEAL... the porous protective film sprayed over fresh fruits and vegetables, annually saves tons of produce from spoiling.



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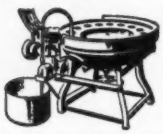

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CONTINUOUS STERILIZING LINE ... (Anderson-Barngrover) used for processing over 70% of the nation's evaporated milk.

CITRUS PACKING EQUIPMENT...a complete line of equipment for processing and packing citrus and other fresh fruits and vegetables.

CROP SPRAYERS...a complete line of crop spraying equipment embodying the famed Bean High Pressure Spray Pumps.

improved properties with . . .

Flexol PLASTICIZER DOP

★ ***Permanence of flexibility—***

★ ***High tensile strength and tear resistance—***

★ ***Excellent low temperature flexibility—***

★ ***Freedom from plasticizer "sweat-out"—***

These and many other improvements in plasticized resinous materials have been made possible by the use of "Flexol" plasticizer DOP and other plasticizers supplied by Carbide and Carbon Chemicals Corporation.

"Flexol" plasticizer DOP (diethylhexyl phthalate) is a water-insoluble, non-volatile liquid with excellent heat and light stability, good electrical properties, and wide compatibility with resinous materials.

Five years of use as an all-purpose plasticizer for the vinyl resins has proved the outstanding value of "Flexol" DOP.

In nitrocellulose and ethyl cellulose lacquers, "Flexol" DOP has durability as well as excellent heat and light stability, and efficient plasticizing action.

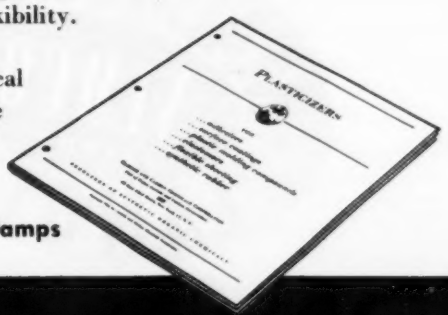
In synthetic rubber, "Flexol" DOP develops high tensile strength, resilience, and low-temperature flexibility. It has a neutral effect on cure.

Write for the booklet "Plasticizers." Our technical representatives will be glad to help you choose the plasticizer that will give you the properties you desire.

OTHER PLASTICIZERS

In addition to "Flexol" DOP, Carbide and Carbon Chemicals Corporation supplies a varied group of plasticizers designed to fit important industrial requirements. These include:

"Flexol" plasticizer 3GH
"Flexol" plasticizer 3GO
"Flexol" plasticizer 4GO
"Flexol" plasticizer 8N8
"Flexol" plasticizer CS-24
"Flexol" plasticizer TOF
Dimethyl Phthalate
Dibutyl Phthalate



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Unit of Union Carbide and Carbon Corporation

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TALK about Lanolin to the average drug store customer, and what's the reaction? SPLENDID!!

While most folks *believe* Lanolin adds something to a product, our researchers can prove that the use of Nimco Brand Lanolin will result in a *better* product . . . a product with a talking point . . . with extra sales appeal.

If you haven't studied the potent possibilities of product improvement available through the use of Nimco Brand Lanolin, this is the time to begin your experiments.

The facilities and the know-how that have made Malmstrom America's Largest Supplier of Lanolin and Degras are available to you, together with samples, should you prefer to conduct your own tests.

America's No. 1 Choice Because It's 5 WAYS BETTER

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1. LOWEST *ODOR* VOLUME
2. GREATER *UNIFORMITY*
3. BETTER *COLOR* QUALITY
4. SMOOTHER *TEXTURE*
5. FINER *BODY* CONSISTENCY

N. I. MALMSTROM & CO.

America's Largest Suppliers of { **LANOLIN** • Anhydrous U.S.P. • Hydrous U.S.P. • Absorption Base • Technical
DEGRAS • Neutral and Common • **WOOL GREASES**

147 LOMBARDY STREET • BROOKLYN, NEW YORK

8th ADVANTAGE...

NOT WET BY MOLTEN METAL!

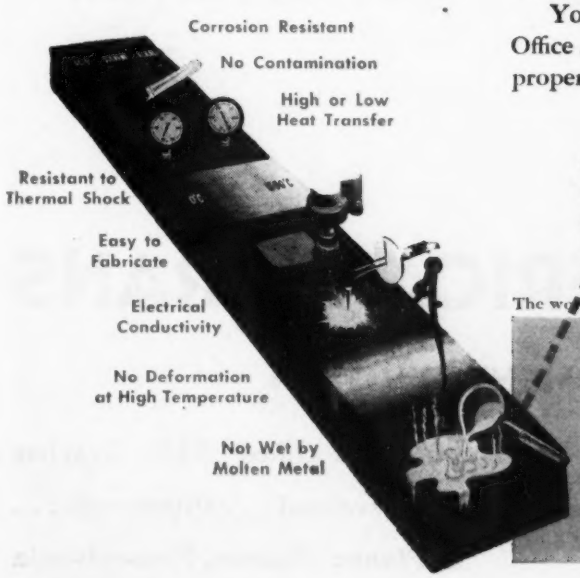
IMAGINE!—1500 steel ingots on graphite stool inserts in one plant—*without any stickers!* That's because molten metals simply do not stick to carbon or graphite!

This eighth advantage of "National" carbon or graphite is only one of many responsible for the adoption of these materials by the metal-working industries, in the form of stool inserts, mold plugs, molds, mold wash (graphite powder), run-out troughs, and furnace linings. Another advantageous feature in run-out troughs and furnace linings: the carbon blocks are unaffected by the most corrosive slags.*

You are invited to get the full story . . . from our nearest Division Office . . . on carbon's, or graphite's, truly remarkable *combination* of properties, whether in the ordinary, porous, or impervious forms.

BAR OF WHAT?

Carbon, Graphite, or
"Karbate" materials, of course!



***Chemical Engineers Please Note**

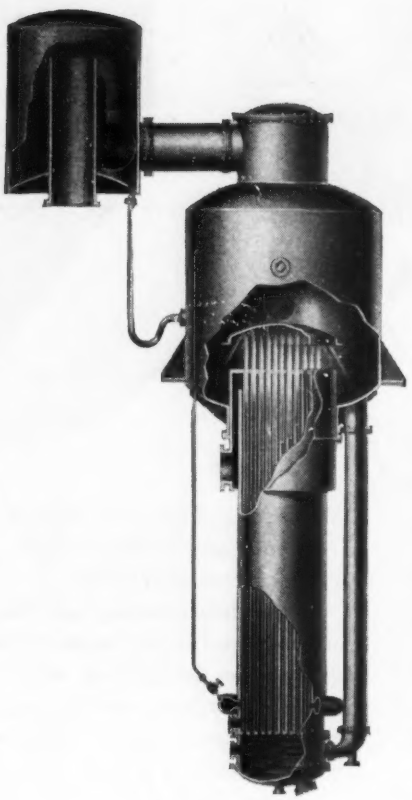
Of parallel importance to the chemical industries are other advantages of "National" carbon and graphite and "Karbate" impervious materials. They are resistant to the corrosive action of most acids, alkalies, and solvents, and they do not contaminate solutions.

GENERAL AMERI

WE HAVE FACILITIES AND EXPERIENCE

CONKEY EVAPORATOR EQUIPMENT

. . . comprises a modern line of pressure and vacuum evaporators in multiple effect and in a full range of sizes and basic designs for all process requirements. Designs are readily adaptable to meet special process requirements. Conkey Evaporators are fabricated in all usual materials of construction and in a wide range of clad and special metals and protective coatings to resist corrosion or prevent contamination of the products handled.



CONKEY FILTERS AND EVAPORATORS, TURBO-MIXERS, PETERSON SYNCRO-DRUM FILTERS, GENERAL AMERICAN HYDROSEPARATORS AND CLASSIFIERS, AMERICAN DRUM DRYERS, REICH PROCESSES, LOUISVILLE ROTARY DRYERS, COOLERS AND PRESSES

GENERAL AMERICAN TRANS

PROCESS EQUIPMENT DIVISION

● *General Sales Office:* 513b Graybar

● *Sales Offices:* Chicago . . . Sharon . . . Louisville . . . Cleveland . . . Pittsburgh . . .

● *Plants:* Sharon, Pennsylvania

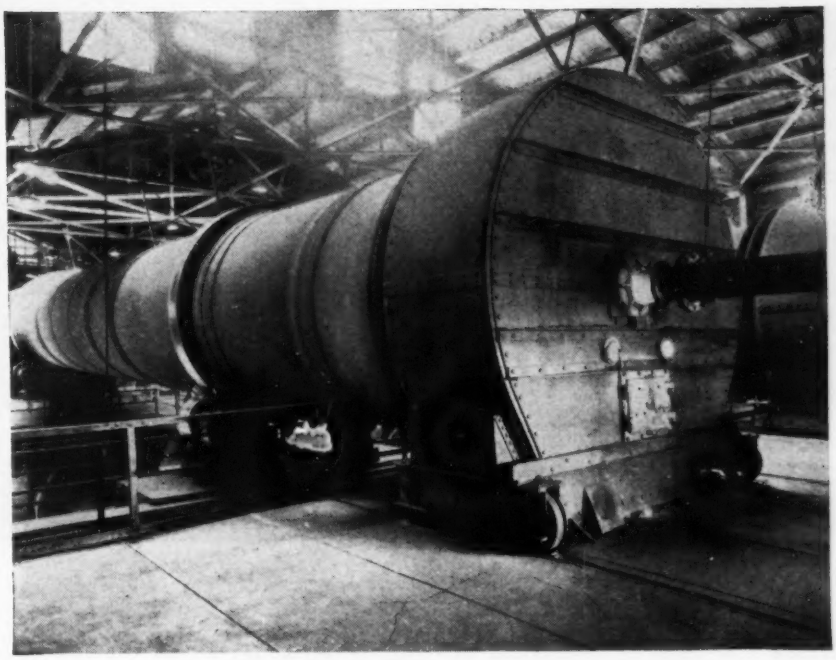
GATX GENERAL AMERICAN CAN designs and builds

TO HELP SOLVE YOUR PROBLEMS

PLATE-FABRICATION OF EVERY KIND

The Plate and Welding Division at Sharon, Pa., is equipped to fabricate practically *anything* made of carbon, stainless or alloy steels, aluminum or other special alloys, either welded or riveted. . . . Facilities include complete X-ray equipment, heat-treating and stress-relieving furnaces, testing laboratories, and an experienced Erection Department.

You name it — we'll build it! Write for full details.



TANKS, STILLS, DIGESTERS, HEATERS, PRESSURE VESSELS, CRYSTALLIZERS, HEAT EXCHANGERS, MIXING KETTLES, PREHEATERS, STACKS, BINS, PENSTOCKS, SCRUBBERS, KILNS

PORTATION CORPORATION

PLATE AND WELDING DIVISION

Building, New York 17, New York

St. Louis . . . Salt Lake City . . . San Francisco . . . Tampa . . . Washington, D. C. and Louisville, Kentucky

Purify and Polish up Plasticizers .... with NUCHAR

Purification by adsorption with Nuchar Activated Carbon has replaced distillation methods in many instances in the manufacture of organic plasticizers. The use of Nuchar Activated Carbon to remove impurities improves the marketability and saleability of these and many other products by:

1. Removing objectionable odors and colors.
2. Producing a product of greater clarity, brilliance, and higher purity.
3. Effecting the removal of undesirable, invisible, organic impurities (as measured by the permanganate test), without altering the molecular structure of the product being treated.
4. The separation and removal of seen and unseen impurities by adsorption methods employing Nuchar Activated Carbon is definitely an economical process which results in monetary savings when compared to other purification processes.

Producers of plasticizers are adopting Nuchar as the new purifying medium because Nuchar Activated Carbon, with its tremendous surface area, inherent reserve power, and superlative adsorptive ability, can readily be applied in chemical processes where "polishing-up" and purification of products is desired.

Valuable information, the result of long experience gained in the application of Activated Carbon is available to prospective users of Nuchar Activated Carbon, and our technical staff will be glad to assist you, to suggest the best operating conditions and grade of Nuchar best fitted for your product.

Nuchar Activated Carbons ★ Abietic Acid ★ Snow Top Precipitated Calcium Carbonate ★ Liquid Caustic Soda ★ Chlorine Indulin (Lignin) ★ Liqro Crude Tall Oil ★ Indusoil Distilled Tall Oil ★ Tall Oil Pitch ★ Sulphate Wood Turpentine

NUCHAR

INDUSTRIAL CHEMICAL SALES

DIVISION WEST VIRGINIA PULP AND PAPER COMPANY

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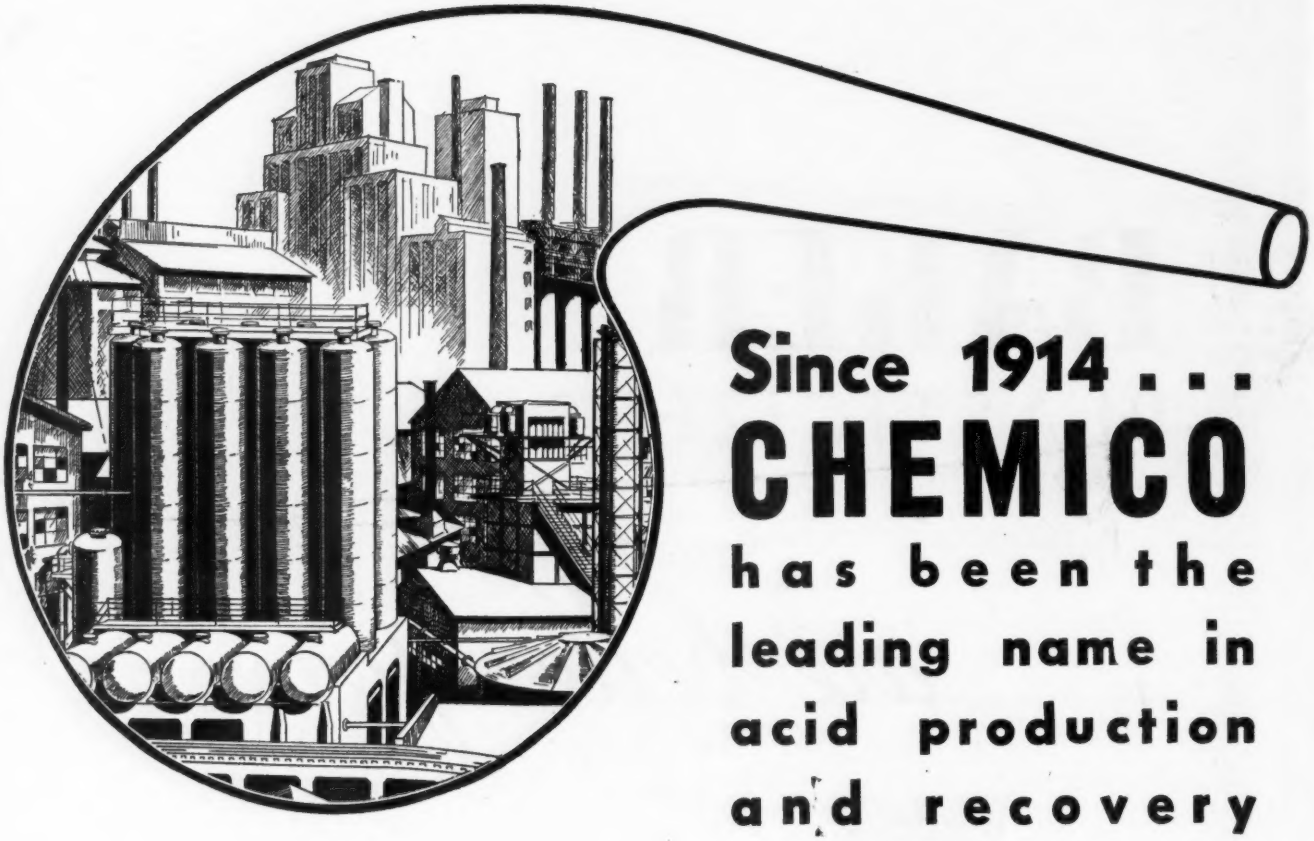

Since 1914 . . . CHEMICO has been the leading name in acid production and recovery plants

The 31 years that have elapsed since the establishment of CHEMICO have seen a continuous and rapid development in petroleum refining processes.

Throughout this period, the design of CHEMICO Acid Plants has kept fully abreast with the demands of the industry for more acid, stronger acid, lower-cost acid. Each successive refining process—including the latest, alkylation—has found the CHEMICO organization prepared to help secure best results.

Whatever may be your acid production or recovery requirements, you can depend upon exactly suitable CHEMICO processes and equipment, selected or designed by experienced acid technologists with unequaled resources and facilities and backed by guarantees of quality and performance.

Your inquiry is invited and will involve no obligation on your part.

CHEMICO
CHEMICAL CONSTRUCTION CORP.

Specialists in:
Sulphuric Acid Production and Concentrating Plants

Synthetic Ammonia and Synthetic Methanol Plants

Nitric Acid Manufacturing Plants and Concentrators

Ammonia Oxidation Units

Phosphoric Acid Manufacturing Plants and Concentrators

Plants for Ammonium Phosphate, Ammonium Sulphate, Ammonium Nitrate, Calcium Nitrate, Alums and other heavy chemical salts

CHEMICAL CONSTRUCTION CORPORATION

A unit of AMERICAN CYANAMID COMPANY

EMPIRE STATE BLDG., 350 FIFTH AVE., NEW YORK 1, N. Y.

European Repr.: Cyanamid Products, Ltd., Berkhamsted, Herts; England

Cables: CHEMICONST, New York

CHEMICO PLANTS are PROFITABLE INVESTMENTS

A VERSATILE CHEMICAL *for Many Syntheses*

SHARPLES DIETHYLAMINE

$(C_2H_5)_2NH$

SPECIFICATIONS

Color	Water White
Sp. Gr. at 20/20°C.	0.71
Diethylamine Content—not below	98%
Water Insolubles	None
Distillation:	
Initial Boiling Point	53.0°C.
Final Boiling Point	59.5°C.

PROPERTIES

Molecular Weight (Calculated)	73.14
Average Weight at 20°C.	5.9 lbs./gal.
Flash Point (open cup)	Below 0°F.
Freezing Point	Approx. –50°C.
Solubility in:	
Water	Complete
Methanol	Complete
Ether	Complete
Benzene	Complete

Diethylamine undergoes typical reactions with aldehydes, ketones, oxides, phosgene, carbon disulfide, chlorohydrins, cyanates, and thiocyanates.

The more important applications of Diethylamine include its use as an intermediate for the synthesis of several vulcanization accelerators and medicinal chemicals. The properties and characteristics described above may suggest new ideas for the utilization of this versatile amine.

Sharples Diethylamine is readily available in quantities up to and including tank cars. Samples will be sent promptly upon receipt of your request on company letterhead.

SHARPLES TRADE MARK CHEMICALS

ARMY E NAVY

SHARPLES CHEMICALS INC.

PHILADELPHIA CHICAGO NEW YORK

SHARPLES SYNTHETIC ORGANIC CHEMICALS

PENTASOL* (AMYL ALCOHOLS)
PENT-ACETATE* (AMYL ACETATE)
PENTALARM* (AMYL MERCAPTAN)

BURAMINE* (BUTYL UREA, Tech.)
PENTAPHEN* (p-tert-AMYL PHENOL)
VULTACS* (ALKYL PHENOL SULFIDES)

PENTALENES* (AMYL NAPHTHALENES)

AMYLAMINE
DIAMYLAMINE
TRIAMYLAMINE

ETHYLAMINE
DIETHYLAMINE
TRIETHYLAMINE

BUTYLAMINE
DIBUTYLAMINE
TRIBUTYLAMINE

DIETHYLAMINOETHANOL
ETHYL MONOETHANOLAMINE
ETHYL DIETHANOLAMINE
MIXED ETHYL ETHANOLAMINES
DIBUTYLAMINOETHANOL
BUTYL MONOETHANOLAMINE
BUTYL DIETHANOLAMINE
MIXED BUTYL ETHANOLAMINES

TETRAETHYLTHIURAM DISULFIDE
TETRAETHYLTHIURAM MONOSULFIDE
TETRAMETHYLTHIURAM DISULFIDE
ZINC DIETHYLDITHIOCARBAMATE
ZINC DIMETHYLDITHIOCARBAMATE
ZINC DIBUTYLDITHIOCARBAMATE
CUPRIC DIETHYLDITHIOCARBAMATE
SELENIUM DIETHYLDITHIOCARBAMATE

AMYL CHLORIDES
DICHLORO PENTANES

o-AMYL PHENOL
DIAMYL PHENOL

MIXED AMYLENES
AMYL SULFIDE

DIAMYLPHENOXY ETHANOL

* Trademark Registered

SHARPLES CHEMICALS INC.

EXECUTIVE OFFICES: PHILADELPHIA, PA.
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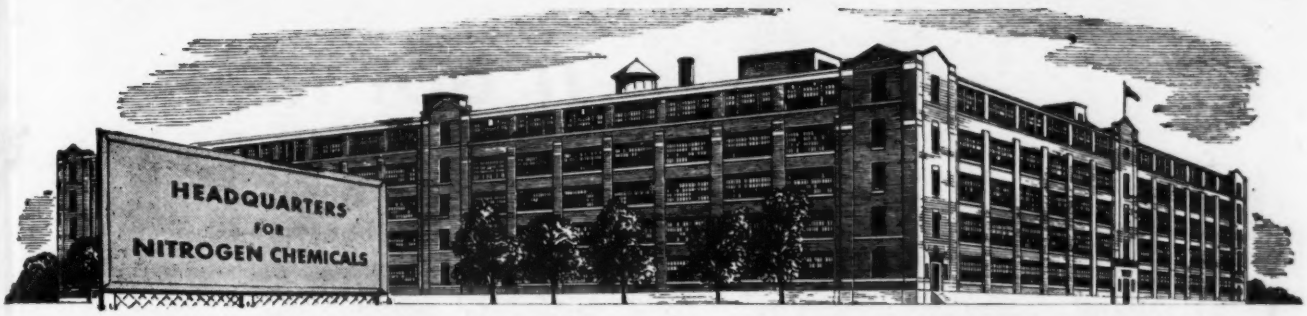

NO. 2 OF A SERIES OF DIGEST REPORTS FROM CYANAMID RESEARCH LABORATORIES

AN OPPORTUNITY FOR SYNTHESIS THROUGH USE OF TIMELY CHEMICAL DEVELOPMENTS

AERO* ETHYLENE CYANOHYDRIN

$HO\text{-}CH_2CH_2\text{-}CN$

NOW AVAILABLE FOR FIRST TIME IN COMMERCIAL QUANTITIES

(96—98 per cent pure)

Soluble in acetone, chloroform, ethanol, and water.

Partially soluble in diethyl ether.

Insoluble in benzene, carbon tetrachloride, and naphtha.

The molecular weight is 71.05.

Compound boils at 221° C. at 760 mm.

Specific gravity is 1.04 at 25° C. giving a weight of 8.7 pounds per gallon.

An important intermediate in polymer formation

Ethylene Cyanohydrin and many of its derivatives can be readily dehydrated to provide unsaturated intermediates of interest to plastic chemists.

Has two reactive groups

Ethylene Cyanohydrin combines the properties and reactivity of both a nitrile and an alcohol. The nitrile radical can be hydrolyzed to the corresponding acid and the hydroxyl radical can be esterified.

*Reg. U. S. Pat. Off.

American CYANAMID & Chemical Corporation

(A Unit of American Cyanamid Company)

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JAY CEE

SILICA GEL

PROTECTS TELETYPE* EQUIPMENT FROM MOISTURE DAMAGE • • •

Yes . . . this Teletype printer arrived "perfectly dry" . . . thanks to Jay Cee Silica Gel —which is protecting innumerable over-seas shipments of delicate machines, instruments and weapons from moisture damage.

A few small cotton bags containing this ideal drying agent are enclosed in the box or carton with the equipment. The phenomenal power of Jay Cee Silica Gel to absorb the atmospheric moisture within the container prevents rust or corrosion in transit. Jay Cee Silica Gel is also used in packages of foods, fabrics, chemicals, and other products. Moreover, it has wide application in the air conditioning, refrigeration, and chemical industries. Jay Cee Silica Gel is clear white; passes a rigid section test, meets exacting Government specifications; is strictly a quality product.

JOBBERS WANTED—A few excellent Jay Cee Silica Gel sales territories are still open to jobbers. Write for details.

* Registered trade-mark

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INDUSTRY AVENUE
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ORONITE CHEMICALS

THE NAME TO WATCH IN CHEMICALS

MODERN PROTECTIVE COATINGS MUST BE BACKED BY CHEMICAL INTEGRITY

Chemicals which can meet the stiffest tests of modern protective coatings, in all types of applications, are produced by Oronite with the same integrity of manufacture that has characterized all Oronite products.

If you need chemicals heretofore unavailable, or if you have a problem for seasoned research men, do not hesitate to write or call one of the offices listed below.

ORONITE CHEMICAL COMPANY

Russ Building, San Francisco 4, California
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30 Rockefeller Plaza, New York 20, N. Y.
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There's a POWELL to solve

The leadership of Powell Valves in the corrosion resistance field is based on two simple principles—practical designs to insure the most efficient operation under given service conditions and selection of materials best adapted to afford maximum resistance to the corrosive elements to be encountered.

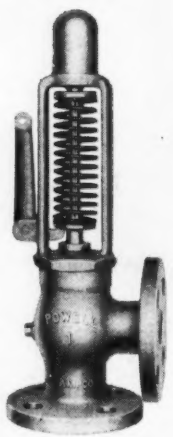
To meet today's innumerable corrosion problems in flow control, Powell offers a complete line of valves of all necessary types—Globe, Gate, Angle, Y, Check, Relief and Flush Bottom Tank Valves, Cocks and Liquid Level Gauges—made in a wide variety of Pure Metals and Special Alloys*. (Write for our new booklet "Powell Valves for Corrosion Resistance").

All Powell Valves for Corrosion Resistance, including those shown here, are available in practically all of the materials listed below. Powell Iron and Steel Valves with trim, or working parts, made from these materials are also available.

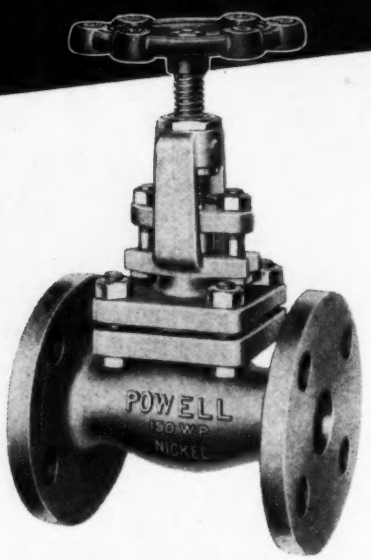
When planning an installation where corrosion is a factor, call on Powell Engineers for consultation and advice.

*Powell Valves for Corrosion Resistance are now available in the following pure metals and alloys. Acid Bronzes, All Iron, Aluminum, Ampco Metal, Carbon Steel, Everdur, Hard Lead, Hastelloy Alloys "A", "B", "C" and "D", Herculoy, Illium, Inconel, Monel Metal, Nickel (Pure), Nickel Iron, Ni-resist, Silver (Pure), 4-6% Ch., 5% Mo. Steel, 18-8S, 18-8S Mo., Durimet "T" and "20", D-10, Misco "C", 11.5-13.5% Chromium Iron; 18% Chromium Iron, 28% Chromium Iron, 25% Ch. 12% Ni. Alloy Steel. Others will be added if, and when the need arises.

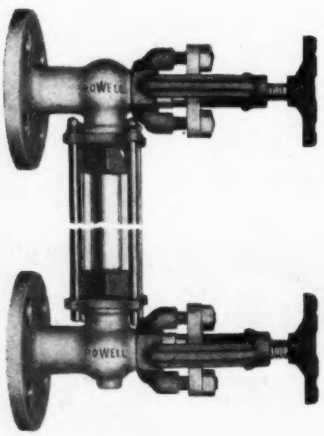
The Wm. Powell Company
Dependable Valves Since 1846
Cincinnati 22, Ohio
DISTRIBUTORS IN ALL PRINCIPAL CITIES



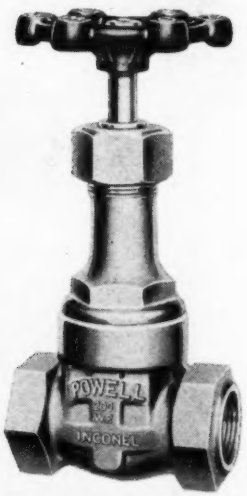
Ampco Metal Relief Valve with flanged end inlet and outlet. Sizes, ¾" to 4", incl.



150-pound Nickel Globe Valve, with flanged ends, bolted flanged bonnet and outside screw rising stem. Sizes, ¼" to 3", inclusive.



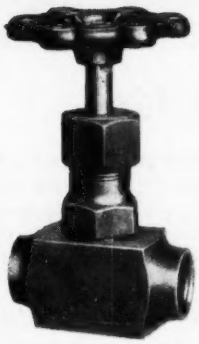
Flanged end O. S. & Y. Liquid Level Gauge for 125-pounds W.W.P. Available in ½" and ¾" sizes with ¾" glass. Valves with quick closing threads on stem can be supplied for lever and chain operation.



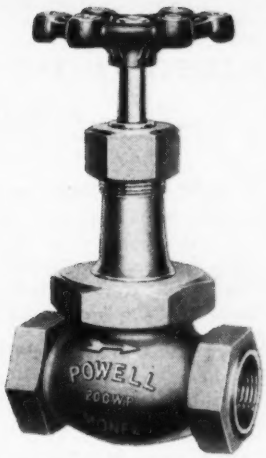
200-pound Inconel Gate Valve. Screwed ends, screwed-in bonnet, and inside screw rising stem. Sizes, ¼" to 2", inclusive.

POWELL

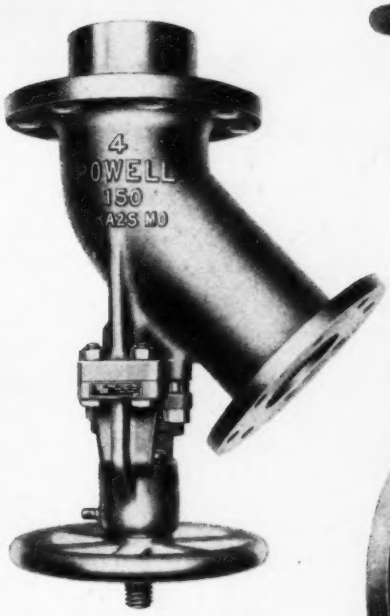
VALVE every corrosion problem in flow control.



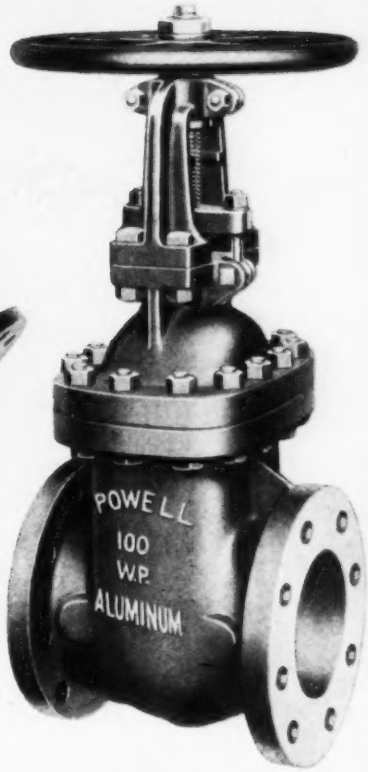
Hastelloy Alloy Needle Globe Valve. Sizes, $\frac{1}{8}$", to 1", incl.



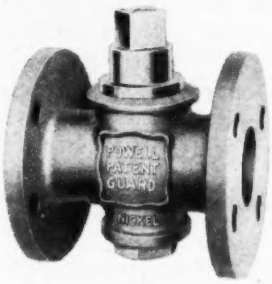
200-pound Monel Metal Globe Valve, with screwed ends, union bonnet and plug-type disc. Sizes, 1" to 2", inclusive.



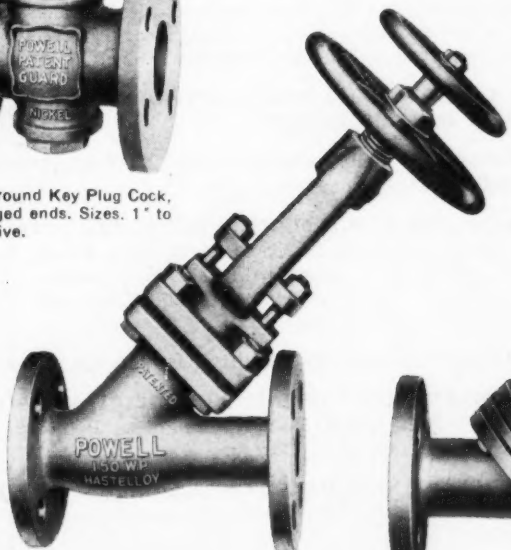
150-pound Stainless Steel Flush Bottom Tank Valve, for attaching to metal tanks and autoclaves. In this design, the disc rises into the tank to open the valve. Available in sizes from $\frac{3}{4}$" to 8", inclusive.



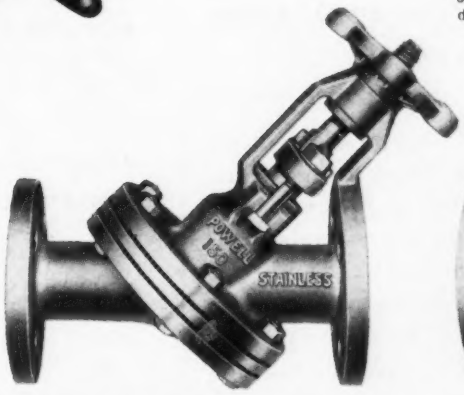
Large size 100-pound Aluminum Gate Valve, with flanged ends, bolted flanged bonnet, outside screw rising stem and taper wedge double disc. Can be supplied with 18-8 S disc and stem.



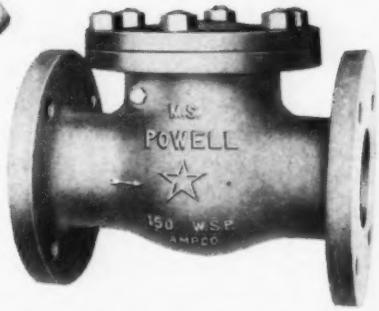
Nickel Ground Key Plug Cock, with flanged ends. Sizes, 1" to 3", inclusive.



150-pound Hastelloy Alloy "Y" Valve, with flanged ends, bolted flanged bonnet, and outside screw rising stem. Equipped with Powell Patented Seat Wiper, which clears the faces of any corrosion products or adhering materials, insuring a tight metal to metal contact between seat and disc. Sizes $\frac{1}{4}$" to 2", incl.



150-pound Stainless Steel Separable Body, Reversible Seat "Y" Valve. Lower half of body can be unbolted and turned through an arc of 180 degrees to make a 90-degree angle valve. Sizes, $\frac{1}{2}$" to 4", inclusive.



150-pound Ampco Metal Swing Check Valve, with flanged ends and bolted flanged cap. Sizes, 2" to 12", inclusive.

VALVES

In 1945 *Significant New Products* from Columbia Research Laboratories

Butadiene Monoxide
(Technical Bulletin BMO-44-1)

Diglycol Chloroformate
(Technical Bulletin T-100)

Butyl Diglycol Carbonate
(Technical Bulletin T-300)

Butoxyethyl Diglycol Carbonate
(Technical Bulletin T-301)

Phenyl Diglycol Carbonate
(Technical Bulletin T-302)

Butadiene Monochlorohydrin
(Technical Bulletin T-400)

COLUMBIA CHEMICALS

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CINCINNATI • CLEVELAND • PHILADELPHIA • MINNEAPOLIS
CHARLOTTE • SAN FRANCISCO

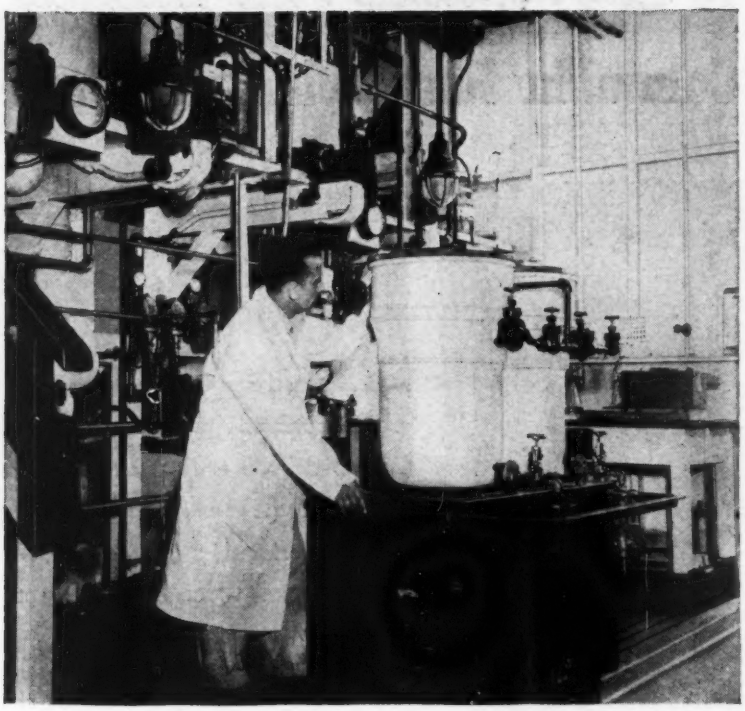
THE potentials present in these new Columbia products represent a valuable addition to the chemistry in such varied fields as lubricants, paints, plastics, pharmaceuticals, resins, rubber and many other products.

The most recent development—Butadiene Monochlorohydrin, is now available in experimental quantities as an 80% solution in water. It is suggested for processes requiring an unsaturated alcohol . . . the presence of the Chloromethyl grouping contributes excellent solvent properties for organic compounds . . . the lability of the halogen suggests uses of derivatives of Butadiene Monochlorohydrin in bactericidal and insecticidal compositions

SEND FOR INFORMATION

If you wish to investigate the possibilities of any of these products, you are invited to write for the Technical Bulletins describing them. Samples may also be obtained for experimental purposes.

PITTSBURGH
PLATE GLASS COMPANY
COLUMBIA CHEMICAL DIVISION
GRANT BUILDING • PITTSBURGH 19, PA.



Final stage in the purification of penicillin—the removal of pyrogens by filtration of the penicillin concentrate.

Penicillin Merck meets the recognized high standard of quality established for all Merck products. It is subjected to repeated tests and control procedures throughout every step of the production process, and the finished product is assayed, tested, and approved under rigid standards established by the Food and Drug Administration and by the Merck Analytical Laboratories.

★ ★ ★

A GLIMPSE AT THE RECORD

IN 1940 Merck research on antibiotics concentrated on Penicillin.

IN 1941 Merck brought about a reciprocal arrangement between British and American investigators to spur the production of Penicillin in co-operation with the United States and British governments.

IN 1942 Merck supplied Penicillin for the first case of bacteriemia successfully treated with this drug in the United States.

IN 1943 Merck sent shipments of Penicillin to England by air transport for urgent therapeutic use by the United States Army Medical Corps.

IN 1944 Merck was sending ever-increasing supplies of Penicillin to our Armed Forces.

AND NOW in 1945, Merck production of Penicillin has reached a point where, in addition to meeting military requirements, large quantities are being produced for civilian medical needs.

PENICILLIN
MERCK
ACCEPTED AMERICAN MEDICAL ASSN. Council on Pharmacy and Chemistry
Council Accepted

Literature on request

BUY and HOLD U. S. Savings Bonds for Security

MERCK & CO., Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

In Canada: MERCK & CO., Ltd., Montreal and Toronto

Hooker Acid Chlorides Meet a Wide Range of Needs

WHILE the Hooker chemicals listed below are all acid chlorides, their properties and characteristics are such that among them you will find chlorinating agents and intermediates for the manufacture of dyestuffs, plasticizers, and a wide variety of other organic compounds. Whether you work with soaps or dyes, with pharmaceuticals or lubricants, if you use chemicals, some of the acid chlorides may make your work easier.

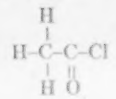
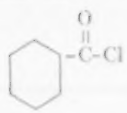
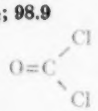
Brief descriptions and some of the uses of these acid chlorides are given below. Technical Data Sheets and samples will be furnished when requested on your letterhead. For more information consult our Technical Staff for help on how Hooker Chemicals can solve your specific problems.

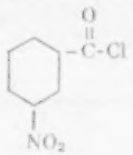
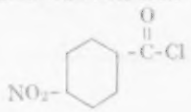
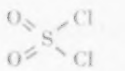
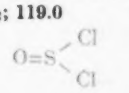
HOOKER RESEARCH *Presents*

TETRAHYDROFURFURYL OLEATE

$CH_3(CH_2)_7CH{:}CH(CH_2)_7COOCH_2OC_4H_7$

Here is a recently developed Furfural derivative that is winning a place for itself in the plastics field. Chemists working with plastics will find this Hooker chemical an excellent plasticizer for imparting flexibility at low temperatures to polyvinyl chloride. It is also used as a plasticizer with other film-forming materials. It is a yellow to light brown oily liquid. Boiling range at 16 mm is 200° to 285°C. It is insoluble in water, soluble in alcohols, esters, ketones, hydrocarbons and chlorinated solvents. Tetrahydrofurfuryl Oleate is now available in commercial quantities. Samples and Technical Data Sheet 343 will be furnished gladly when requested on your letterhead.

PRODUCT *Chemical Formula and Molecular Weight*	DESCRIPTION & USES
Acetyl Chloride CH_3COCl; 78.5 	Clear, colorless to pale yellow liquid. B. R. 5° incl. 51°C. To introduce acetyl group into organic compounds. Manufacture of intermediates, dyes, and pharmaceuticals. Reagent in manufacture of sulfonated fatty bodies.
Benzoyl Chloride C_6H_5COCl; 140.5 	Clear, colorless liquid. Boiling point 198°C. To introduce benzoyl group into organic compounds. Manufacture of benzoyl peroxide, benzophenone, benzyl benzoates, synthetic perfumes, dyes, pharmaceuticals.
Carbonyl Chloride (Phosgene) $COCl_2$; 98.9 	Liquified gas. F. P. −126°C. B. P. 8.2°C. Manufacture alkyl and aryl chlorocarbonates and dicarbonates; Michler's ketone; dye intermediates; metal chlorides and anhydrides; pharmaceuticals; perfumes.

PRODUCT *Chemical Formula and Molecular Weight*	DESCRIPTION & USES
Metanitrobenzoyl Chloride $C_6H_4NO_2COCl$; 185.5 	Yellow to brown liquid partially crystallized at room temperature. Last crystal point 28° to 31°C. Manufacture of dyes for fabrics and color photography; pharmaceuticals.
Paranitrobenzoyl Chloride $C_6H_4NO_2COCl$; 185.5 	Yellow crystalline solid. M. P. 70°C minimum. Manufacture of novocaine; dyes.
Sulfuryl Chloride SO_2Cl_2; 135.0 	Light yellow liquid. B. R. 2° incl. 69.1°C. Reacts with organic acids to form other chlorides and anhydrides. Chlorinating agent to produce chlorphenol and other chlorination reactions in organic synthesis.
Thionyl Chloride $SOCl_2$; 119.0 	Clear, yellow to red liquid. B. R., refined grade, 75° to 78°C. Manufacture organic and chlorides and anhydrides, alkyl chlorides from corresponding alcohols.

Butyryl Chloride **Caprylyl Chloride**
Propionyl Chloride **Pelargonyl Chloride**

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A pure phenolic resin entirely new in formula, properties and *results*. Costs less, works faster, yields higher viscosity, dries quicker than any prewar pure phenolic. No. 1 choice for high grade enamels and spar varnishes.

No. 1337 BECKOSOL

A new pure alkyd, modified with a pure phenol, for car and truck refinishing assuring definitely superior water spotting resistance and very fast dry. In fact, it can be taped after overnight setting. All this, plus exceptional durability!

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The addition of only 1% to 5% of this new alkyd hardener speeds up dry and hardening of air-dry products faster than anything previously known. Highly suitable for baking, too!

No. 1339 BECKOSOL

A new, pure alkyd, white brushing vehicle for products where maximum gloss retention, plus good initial color and color retention, is desired . . . non-sagging . . . overnight hard dry . . . better water-resistance than any prewar alkyd.

No. 1945 BECKOSOL SOLUTION

A new, non-phthalic alkyd which imparts greater durability than any product in its field . . . fast dry . . . quick through hardness . . . excellent water and alkali resistance. An ideal choice for exterior enamels, porch and deck paints, high grade industrial machinery enamels, etc.

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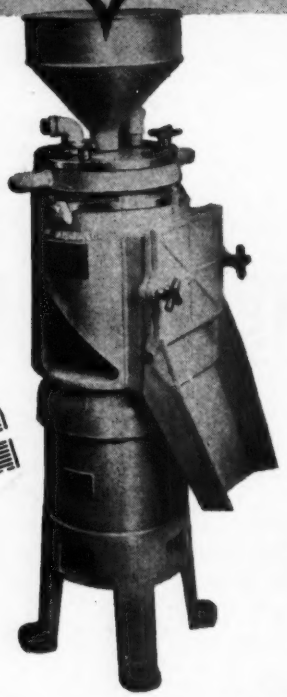

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U.S.I. CHEMICAL NEWS

November ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1945

Synthetic Short Cuts Via New Chemicals Predicted by U.S.I.

Possibilities Barely Tapped for Five New Organic Intermediates

New products, and economical synthetic short cuts to old ones are promised by five new chemicals which U.S.I. has produced by elaisen-type condensations. Although exploration of their full possibilities has been delayed as a result of concentration on specific war problems, these five organic intermediates are on their way toward playing an important part in the synthesis of drugs, medicinals, dyes and specialties.

One substantial use of alpha acetyl butyro lactone is in the synthesis of vitamin B_1. 5-diethylamino pentanone-2 is an important intermediate in the manufacture of atebrin.

A third new organic chemical, ethyl alpha-

(*Continued on next page*)

X-Rays Give Chemists New Tool for Analysis

Closely following the discovery that atoms identify themselves by the amount of X-radiation they absorb, comes the development of special sensitive apparatus to measure this absorption, and give chemistry a new tool for rapid identification of the elements of which a substance is made.

The absorption of X-rays is approximately the same for each element, whether it is gaseous, liquid or solid. For instance, an atom of oxygen will have the same absorption whether it is in air, water or in sand.

To measure these differences in absorption with sufficient accuracy, an ultra-sensitive photo-electric cell of the multiplier type is used in connection with amplifiers in which weak signals are built up until it is possible to measure amounts of radiation with as little energy as one ten-billionth of a watt.

Enough work has already been done with the new method of analysis to show that for certain types of problems it offers clear advantages over older methods.

High Color and Gloss Retention Afforded by New Alkyd Resin

S&W Aroplaz 1241 Now Available Without Restrictions for Architectural Enamels, Marine Finishes, Mill-Gloss Whites

Foreshadowing a whole range of interesting new alkyd resins which will be available to protective-coatings manufacturers as reconversion gets into full swing is S&W Aroplaz 1241, just announced by U.S.I. "1241" is a long-oil, pure, oxidizing alkyd with properties which make it particularly well suited to a wide range of paints and enamels.

Architectural enamels formulated with "1241" will feature pureness of color and color and gloss retention not approached by prewar products.

Important among its characteristics are the pureness of color and high gloss and color retention which "1241" imparts to white enamels. In this respect, as well as in brushing qualities, exposure resistance and durability, it is superior to comparable finishes made with conventional alkyds of similar oil length. Films made with Aroplaz 1241 are found to be harder and to show greater resistance to abrasion, water, alkali, solvents and oils.

Relatively Non-Reactive

The new resin is a relatively non-reactive vehicle, which may be used with normal percentages of the usual basic pigments. It blends well with a wide variety of drying oils, varnishes and other alkyds. Blended with oil paints, it increases their hardness, speeds up drying and improves gloss retention and durability.

Exterior Applications

Alone or extended slightly with oils, "1241" makes excellent trim and trellis paints, as its durability is better than conventional long-oil alkyd resins. While it may be formulated with zinc oxide, it should be noted that inclusion of zinc oxide results in a slight loss of initial gloss and that gloss retention is also affected by the formation of the characteristic haze. However, gloss and gloss retention remain noticeably superior to that of coatings formulated with regular alkyds.

Supplies of S&W Aroplaz 1241 are not subject to allocation and are fully available for any application. Samples and additional data may be had on request.

SPECIFICATIONS

Solution in Mineral Spirits	69-71% N.V.
Viscosity (G.H.)	Y-Z_1
Acid Number	6-10
Color (G.H. 1933)	7-9
Wt./gallon at 25° C	8.05-8.15 lbs.

Solubility: Complete in petroleum and coal-tar hydrocarbons. Insoluble in ethanol. Compatible with wide range of vegetable drying oils, varnishes and other alkyds.

Better Marbleized Finishes

Layers of paint or enamel in several colors are floated on the surface of a tank filled with an aqueous solution. Articles are dipped into the tank through the layers of paint and pick up a coating of streaks of different colors in a marble-like effect, which wrinkles on drying, according to the patent.

Detects Toxic Gases

Toxic gases can be detected by bubbling air suspected of containing them through an ionizable solution such as ethanol and water, according to a recent patent. After the toxic gases have been absorbed, changes in the electrical resistance of the liquid indicate the presence of a soluble ionizable gas.

Atomic Chain Reaction Hinges on Ether-Purified Uranium Ore

With the publication of the official Smyth report on "Atomic Energy for Military Purposes," the news was out that one of the vital keys to the success of the entire atom-bomb project was ether extraction of uranium ore.

Uranium oxide of unprecedented purity was required to produce metal which would undergo a sustained chain reaction — the type of reaction necessary for either the explosion of U-235 or the production of plutonium. Experiments at the National Bureau of Standards showed that, by an ether extraction, all the impurities could be removed from uranyl nitrate in a single extraction. The report states "The use of this method removed the great bulk of the difficulties in securing pure oxide and pure materials for the production of metal."

Significantly, the report adds "This oxide is now used as a starting point for all metal production, and no higher degree of purity can be expected on a commercial scale. In fact, it was a remarkable achievement to have developed and put into production on a scale of the order of one ton per day a process for transforming grossly impure commercial oxide to oxide of a degree of purity seldom achieved even on a laboratory scale."

This smart Higgins "PT Junior" and many other craft will be a large market for durable marine enamels formulated with such S&W resins as '1241".

Synthetic Short Cuts

(*Continued from preceding page*)

oxalpropionate, has six thought-provoking characteristics: 1. It loses carbon monoxide and yields diethyl methylmalonate on distillation; 2. Heated with ammonia, it forms alpha-methyl-beta-imino succinimide; 3. Boiled with alcoholic potassium hydroxide, it breaks down into propionic and oxalic acids, and alcohol; 4. Heated with ethyl iodide and sodium ethoxide, it yields alpha-methyl-alpha-ethyl-oxalpropionic ester; 5. Heating with dilute sulfuric acid produces propionylformic acid, alcohol, and carbon dioxide; 6. Hydrogenation gives diethyl alpha-hydroxy-beta-methyl-succinate, which yields 3-methyl 1, 2-butanediol, 2-methyl 1, 4-butanediol, alcohols and water.

The following physical constants of these new chemicals may suggest further uses and applications. Samples are available on request.

a-ACETYL BUTYRO LACTONE

Mol. Wt., 128. Sp. Gr., 1.185-1.189 @ 20/20° C. Refractive Index, 1.460 @ 20° C. Boiling Pt., 121-122° C. @ 10 mm. Hg. abs. Colorless liquid. Suggested Uses: Organic synthesis.

5-DIETHYLAMINO PENTANONE-2 (Noval Ketone)

Mol. Wt., 157. Sp. Gr., 0.865 @ 20/20° C. Refractive Index 1.435 @ 20° C. Boiling Pt., 90-92° C. @ 20 mm. Hg. abs. Colorless liquid. Turns dark on storage in contact with air. Suggested Uses: Organic chemical synthesis.

ETHYL ALPHA-OXALPROPIONATE

Mol. Wt., 202, Sp. Gr., 1.0977 @ 20/20° C., Refractive Index, 1.433 @ 20° C., Boiling Pt., 108-109 @ 5.5 mm. Hg. abs. Color light yellow to colorless.

ACETYL PROPYL CHLORIDE (5-Chloro Pentanone-2)

Mol. Wt., 120.5 Sp. Gr., 1.054 @ 20/20° C. Refractive Index, 1.440 @ 20° C. Boiling Pt., 71-72° C. @ 20 mm. Hg. abs. Colorless liquid. Turns dark on storage in presence of air. Suggested Uses: Organic synthesis.

METHYL CYCLOPROPYL KETONE

Mol. Wt., 84. Sp. Gr., 0.903 @ 20/20° C. Refractive Index, 1.426 @ 20° C. Boiling Pt., 111-113° C. @ 760 mm. Hg. Colorless liquid. Suggested Uses: Organic synthesis.

Acetone Process Cuts Costs of Mercuric Nitrates

Costs of mercuric nitrates, used as disinfectants and bactericides, can be materially lowered, according to claims made in a new patent.

Mercury diphenyl, dissolved in acetone, is mixed with a concentrated solution of mercuric nitrate in dilute nitric acid and acetone. Upon heating this mixture, the phenyl mercuric nitrate begins to precipitate at 45° C. After the reaction is complete, the phenyl mercuric nitrate is separated by filtration, and additional amounts are secured by evaporating the mother liquor.

Increased Water Content for Zein Solutions

Zein solutions, used in textile and paper finishes, adhesives, and pigment vehicles, can be given greater dispersion in water, according to the claims made by the inventor of a new process for preparing and using zein solutions. The paste described in the patent is composed of zein, ethanol, sulphated stearyl alcohol, and water. It is described as being dilutable with volumes of water far in excess of the quantity which would cause zein precipitation with ordinary mixtures.

Ethanol-Acetone Extract Aids Tetanus Treatment

Curare, a potent and deadly alkaloid used with lethal effects as an arrow-tip poison by South American indians, and by mystery-story writers to confuse the plot, has emerged as an agent to alleviate the agonizing pain of tetanus. Action of the curare extract used is to selectively depress the receptive mechanism of the skeletal muscles.

The active alkaloid used in this treatment, a foreign paper says, is extracted from any of the three forms of gummy, black, crude curare by dissolving in ethanol, evaporating the solution, re-dissolving the residue in water and precipitating out the inert matter with acetone. In addition to potentialities of this curare extract in the treatment of tetanus, it has long been known as a powerful anaesthetic. Its use is now suggested in the treatment of hydrophobia and in lessening the after-effects of shock-therapy treatment of certain mental disorders.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

Protective finishes, produced by an oxidizing process, are said to be applicable to copper alloys, brass, zinc, iron and steel. Finishes are said to be stable, long-lived and wear resistant. Colors, in addition to black, can be applied to copper and brass. Company offers a similar treatment for aluminum products which they say produces a hard, gray corrosion-inhibiting surface. **(No. 996)**

USI

Acid-and-alkali-proof cement, claimed to be inert to all alkalis, fats and grease, and most acids, is available for ceramic lining constructions. It is said to be abrasion resistant, quick setting and easy to use. **(No. 997)**

USI

A new liquid adhesive, for joining metals, wood, plastics and glass is said to combine exceptional coverage with high strength. Curing is done under heat and pressure. **(No. 998)**

USI

A new silicon lubricant, for valves handling steam, hot gases, high vacuum, and most dilute mineral acids, is offered with the statement that its viscosity remains unchanged from 40 to 400 F. **(No. 999)**

USI

A replacement for China Wood Oil is offered in the form of a modified linseed oil claimed to body rapidly in the varnish kettle, to be compatible with resins used to produce durable, fast drying varnish films. **(No. 1000)**

USI

A "harnessed" formaldehyde is offered to provide better control of the reaction of formaldehyde with various chemicals, including phenols, amines and hydrocarbons. The new formaldehyde is said to increase the yield and improve the quality of end products. **(No. 1001)**

USI

A non-inflammable plastic is described as being thermosetting, and having high optical qualities, electrical resistance and resistance to abrasion, oils and most chemicals. Its refractive index is about 1.57. **(No. 1002)**

USI

To dustproof concrete floors, a liquid is available which is designed to fill the pores, and react with the cement to form a tough non-dusting surface that resists the action of moisture and chemicals. It is applied by brush or sprinkler. **(No. 1003)**

USI

An anti-fog film, claimed to penetrate the submicroscopic pores of glass and thus prevent fog, frost, and steam accumulation, is now on the market. It is applied by spreading on both sides of the surface, then polishing. **(No. 1004)**

USI

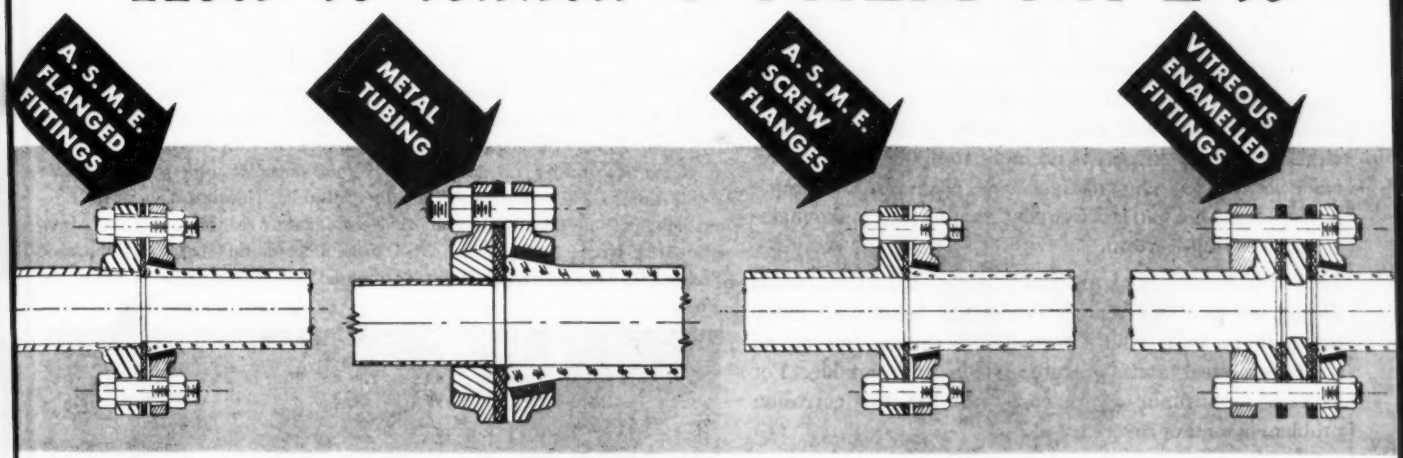
Improved plastic production is claimed for a new organic peroxide, announced as having a higher oxygen content, being purer, and having great utility as a polymerization catalyst for production of plastics where no catalyst diluent can be tolerated. **(No. 1005)**

USI

Bleaching wool, rayon and cotton, without weakening the fabric, is a new application announced for an organic chlorine compound. **(No. 1006)**

USI

How to connect PYREX PIPE *to*



You can easily join Pyrex Pipe anywhere in your existing line. You can get tight, leak-proof connections to whatever piping or equipment you are now using—pipe lines, valves, pumps or tanks.

Standard adaptor connections are stock items for coupling Pyrex Brand Glass Pipe to steel, cast iron, lead, stainless steel, porcelain, hard rubber and rubber covered metal. A good way to find out what Pyrex Pipe will do for you, is to order it for your next unit replacement. Once you experience the advantages, even in partial installation, you will want to install an entire line of Pyrex Pipe.

Where acid conditions prevail, use Pyrex Pipe. Here is a material for use in those acid handling processes where freedom from contamination is important. The high resistance of Pyrex Pipe to acid attack also means a long life for your pipe line and the elimination of the cost and bother of frequent replacement. Lasting transparency, resistance to thermal shock, a smooth hard interior surface that minimizes friction in liquid flow are some of the other advantages of Pyrex Pipe that make it thoroughly efficient, practical and economical. For further information, write today to

Industrial Sales Dept., CI11.

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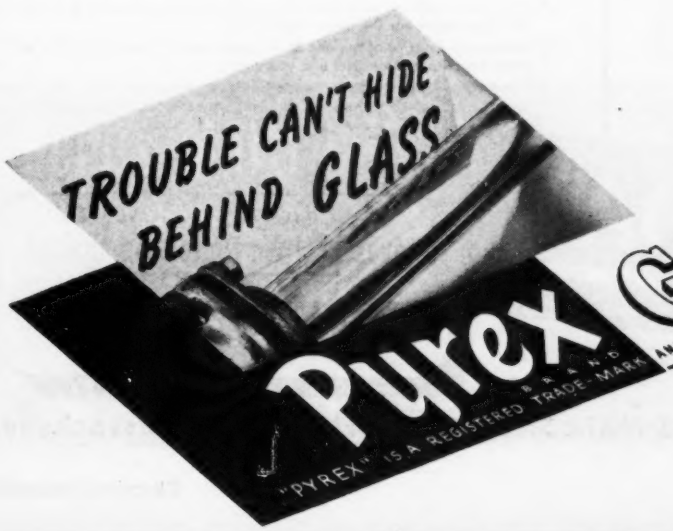
CORNING, NEW YORK



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STOP CORROSION

Prufcoat Protective Coatings

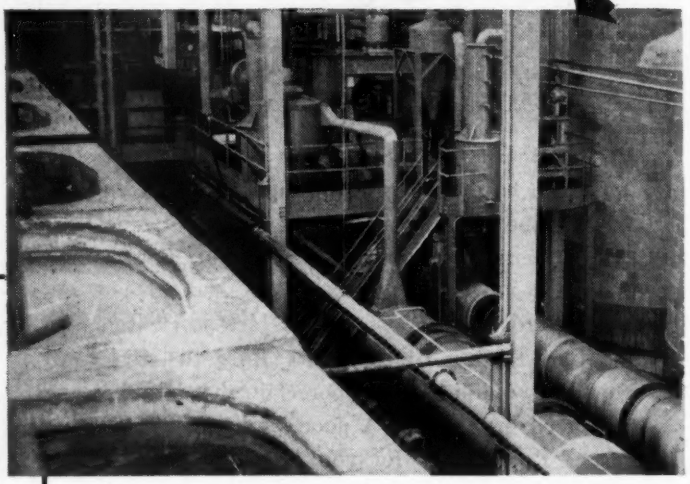
Cut Maintenance Costs

LOW original cost and long life of Prufcoat make its application on all surfaces the lowest cost method of maintenance. For Prufcoat costs only slightly more per gallon than ordinary paint, costs no more to apply, *and yet provides positive protection against acids, alkalis, oil and water.* Thus, longer life and less frequent repaint jobs make maintenance savings certain.

Proved in hundreds of America's largest industrial plants during the past five years*, Prufcoat is being used today not only in areas where corrosion is severe, but on all structural steel and concrete, inside and outside. For Prufcoat cuts maintenance costs whether the corrosion problem is mild or severe.

Whatever your problem may be, chances are Prufcoat can show you a performance-proved treatment. Write today for descriptive folder.

Prufcoat is in use on Concrete Structures, Steel Structures, Railway Tank Cars, Masonry Walls, Concrete Floors, Chemical Handling Equipment, Tank Trucks, Ventilating Systems, Cast Stone, Stucco, Brick, Sprinkler Systems, Cement Blocks, Chemical Tanks, *and has licked corrosion problems involving temperature ranges up to 230° F. and chemical agents such as* Acetic Acid, Alum, Bleach Solutions, Calcium Chloride, Chlorine, Cyanides, Formaldehyde, Flue Gases, Hydrofluoric Acid, Lactic Acid, Mineral Oils, Muriatic Acid, Nitric Acid, Oleic Acid, Oleum, Phosphoric Acid, Salt Solutions, Sodium Hydroxide, Steam, Sugar, Sulfonated Oils, Sulfuric Acid, Tri-Sodium Phosphate.



The Prufcoat film formed after Polymerization has virtually a zero acid number, saponification number and water absorption rate.

PERFORMANCE-PROVED ON CONCRETE AS WELL AS METAL SURFACES

Prufcoat Protective Coatings have been able to perform the heretofore thought impossible job of corrosion-proofing concrete, bricks, masonry, cast stone, etc., as well as metals and less troublesome surfaces. For the Prufcoat film is proof against the alkali reaction of concrete and similar materials, as well as acid-proof. Made from a special combination of synthetic resins and inert pigments, Prufcoat is applied by brush by your own maintenance crew, and dries by evaporation of the volatile solvents. Subsequent polymerization provides a tough, non-oxidizing, completely acid, alkali, oil and waterproof film. The Prufcoat vehicle is crystal clear and contains no drying oils, wax, stearates or bitumen. Plasticity can be controlled from permanent tackiness to brittleness, as desired. Available in a variety of standard colors, making possible identification of lines and other equipment by color.

Prufcoat reports from some of America's largest plants (Names upon request)

- ★ Prufcoat on all structural steel, pipes, pumps and tanks subjected to continuous dilute sulfuric acid fumes, drips and spills. No failure in two years.
- ★ Entire concrete building coated with Prufcoat. No trace of failure due to blistering, peeling or chipping in over five years.
- ★ Prufcoat on railroad tank cars carrying mixed acids and caustics — spills have not affected the coating in over two years.
- ★ Prufcoat on exterior of muriatic acid storage tanks — no failure from spills or fumes since installation over two years ago.
- ★ After several years of experience, Prufcoat has been made the standard corrosion-proofing coating for all maintenance work throughout the plant.

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gives Positive Protection against
ACIDS, ALKALIS, OIL & WATER!

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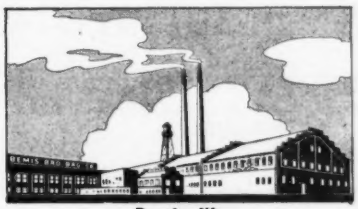
Maybe we've been too Modest

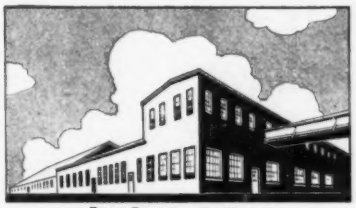
ABOUT BEMIS MULTIWALL PAPER SHIPPING SACK FACILITIES

For years, Bemis has been a leading manufacturer of multiwall paper shipping sacks. Six plants, strategically located north, south, east and west, have given Bemis customers the advantages of flexibility and capacity in production.

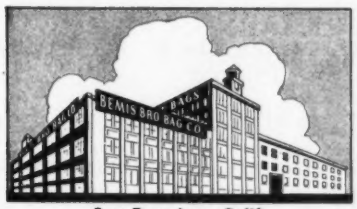
During the war, this flexibility and capacity, plus the Bemis system of planned production, enabled us to do a big job. Yet, in addition to supplying multiwall paper shipping sacks to our Armed Forces, Bemis made an unusual record in fulfilling shipping promises and maintaining quality for its regular multiwall customers.

When you need multiwall paper shipping sacks for old or new products, think of Bemis. It pays to be a Bemis Multiwall Paper Shipping Sack customer.


Peoria, Ill.

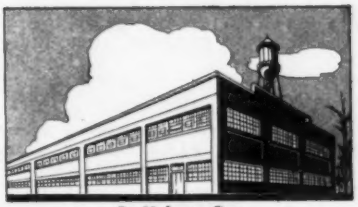

East Pepperell, Mass.


Mobile, Ala.



San Francisco, Calif.


Wilmington, Calif.


St. Helens, Ore

Bemis Multiwall Paper Shipping Sacks

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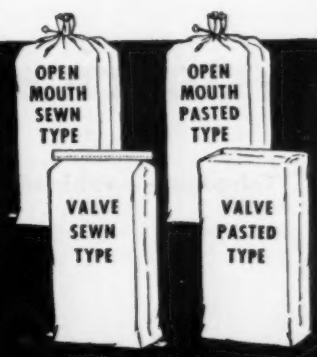

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Proved in Cosmetics! C. P. glycerine's non-toxicity, emollient properties, resistance to evaporation, solvent power, and compatibility make it ideal for use in many cosmetics. Use glycerine!

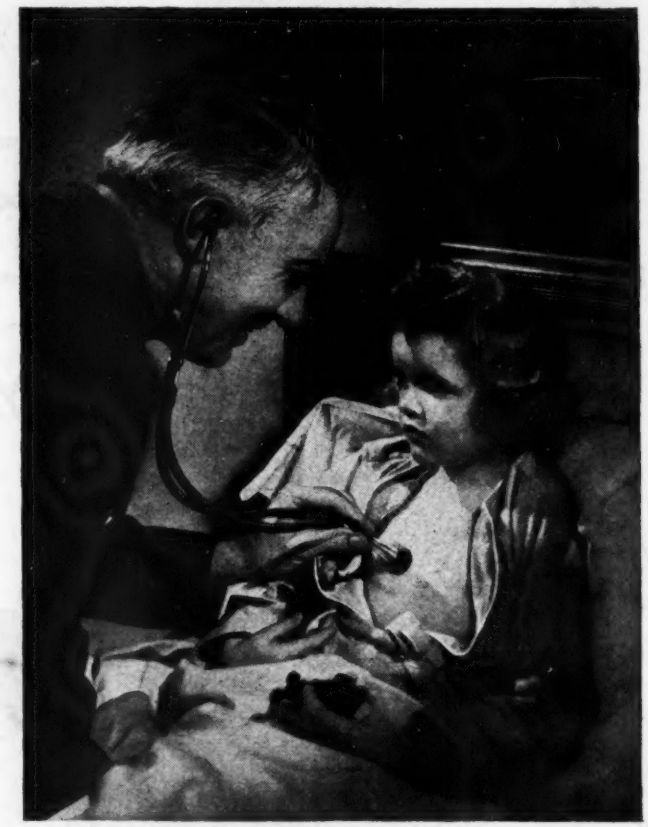
Why Glycerine is a Superior Humectant: PERMANENCE

GLYCERINE as a humectant is permanent. Its permanence is a result of its low vapor pressure, its compatibility with hydrophilic materials, and its lack of tendency to "creep."

In the absence of a permanent humectant, glues dry out and are no longer adhesive and flexible; paper wrappings become dry and brittle; tobacco gives a less smooth and mellow smoke; cosmetics and dentifrices cake and crack; certain leather products become harsh and rough.

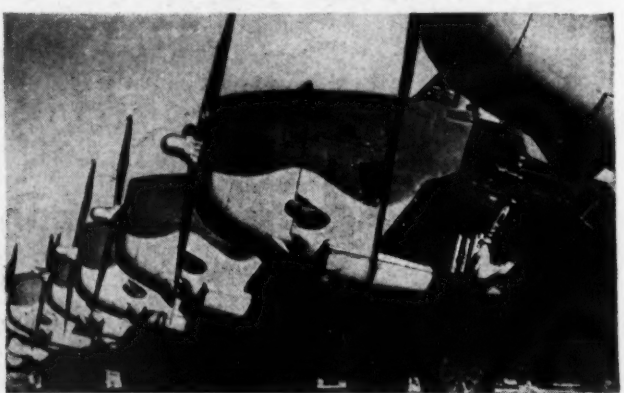
Does the adhesive on your scratch-pad or in a bookbinding become brittle? If so, the chances are that it has not been plasticized with glycerine but with some other material.

Glycerine is not only a superior humectant but a preferred plasticizer, solvent, carrier, preservative, lubricant, and key component in many essential products and materials. Its high viscosity, high solvent power, compatibility, non-toxicity, and other valuable properties can help you make superior products. Use glycerine, the time-tested ingredient, now freely available for the production of civilian goods. Glycerine Producers' Association, 295 Madison Avenue, New York 17, N. Y., Dept. N-7.



Proved in Medicines! C. P. glycerine, used as a solvent, carrier, and component of ointments, emollient solutions, plasters, and many other pharmaceuticals, is an old standby — proved safe.

Proved in Packaging! Because C. P. glycerine is non-toxic, it is used in the manufacture of transparent wrappings coming in contact with foods or food products. Use glycerine—and be sure!

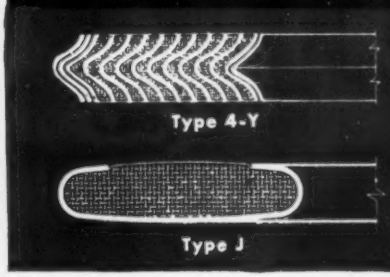


U. S. Navy Official Photo.

Tough Paints! Long-lasting paints for war equipment and for widespread industrial and home use have been made possible with alkyd resins, of which glycerine is an important raw material.

MODERN DEVELOPMENTS OF GASKET RESEARCH

BOILER GASKETS...



Standard Equipment with Leading Boiler Makers

Goetze Boiler Gaskets for handhole, manhole and tube caps are most inexpensive, highly efficient gaskets. They are used as standard equipment by leading boiler makers and are the outstanding preference of boiler operators. Type J Single-Jacketed, Metal-Asbestos Gaskets are available in a choice of metals — steel, copper, Monel, etc., for handholes and tube caps.

Goetze Type 4-Y Spiralwound — an improved Metal-Asbestos Gasket composed of interlocking plies of preformed metal, cushioned with asbestos strip and spirally wound, possesses unusual resilience — makes and maintains a perfect seal, even on badly-warped or pitted surfaces. This type is remarkably strong, highly resistant to corrosion and temperature, may be reused a number of times.

Made in plain or zinc coated cold-rolled low carbon steel and 18-8 Stainless Steel in round, oval or irregular shapes for manholes, handholes and tube caps.

GOETZE GASKET & PACKING CO., INC.
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Ask to have your name added to the list of engineers receiving "The Gasket" — a series of technical bulletins containing original gasket data emanating from the Goetze Research Laboratory. Write on your company letterhead giving your position.

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"America's Oldest and Largest Industrial Gasket Manufacturer"

"The bigger the family—the better the service"

YOU can say that *twice* about a big, smooth-running family like Continental's! It's bigger now and more efficient than ever.

We touch nearly every phase of packaging now. That's why, after careful analysis of your problem, we feel sure we can offer the perfect package for your product. Metal containers, liquid-tight paper cups and containers, fibre cans and drums, steel pails and heavy-duty containers—we make them all.

The armed forces get first call on our facilities now. But keep your eye on Continental! And on Continental's trademark, too! The Triple-C stands for *one* company with *one* policy—to give you only the very best in quality and service.

Tune in: "REPORT TO THE NATION" *every week over coast-to-coast CBS Network*

Continental Fibre Drums—Continental makes a full line of fibre drums, both the all-fibre and the metal-end types, for shipping chemical and pharmaceutical products. "FIBERPAK," illustrated, an all-fibre drum (from ¾ gal. to 67 gal. capacity), and "LEVERPAK" (from 12 gal. to 75 gal. capacity), for finer chemicals and similar expensive materials; "STA-PAK" Drums (from 2 gal. to 32 gal. capacity) for less costly materials such as soap powders, cleansers, colors, detergents. Wide selection of linings, coatings, treatments and constructions to meet specific requirements.

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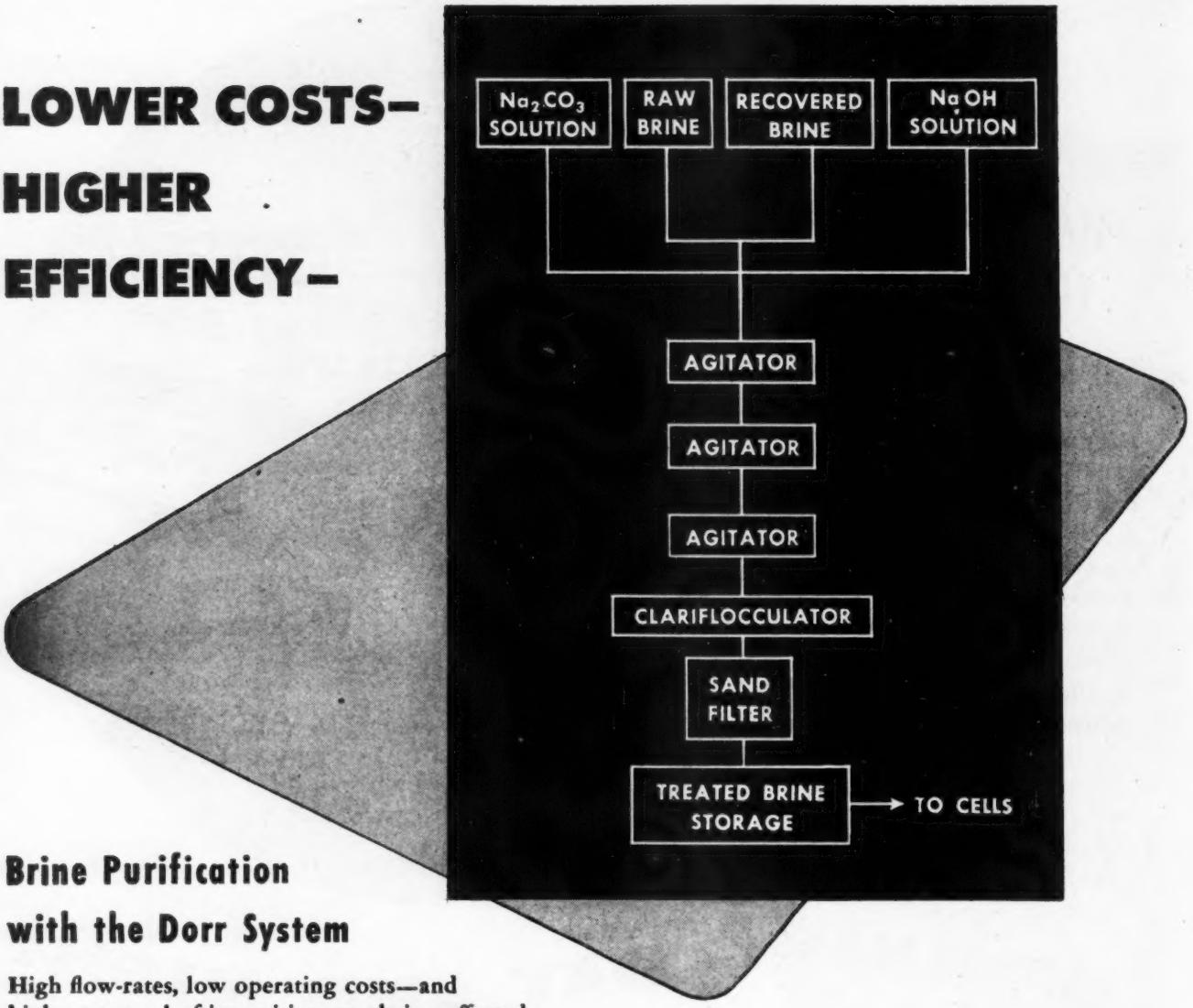

FLOW SHEET FOR DORR SYSTEM OF CONTINUOUS BRINE PURIFICATION

Brine Purification with the Dorr System

High flow-rates, low operating costs—and higher removal of impurities—are being effected with Dorrco Clariflocculators in brine purification installations from coast to coast. And installation costs, too, are low. The Dorr System for Continuous Brine Purification has proved its economy and efficiency both in tests and in actual operation.

The following table shows an analysis of a typical brine before and after purification:

COMPOSITION OF RAW AND PURIFIED BRINE

	Raw Brine	Purified Brine (before filtration)		Raw Brine	Purified Brine (before filtration)
Cl−	183.0 g./l.	182.0	Ca++	1.7	0.004
Na+	117.5	120.4	Mg++	0.09	0.003
SO_4−−	3.4	3.4	Turbidity	Clear	5-7 p.p.m.

If you're converting your present operation or planning to build a new plant, it will be well worth your while to let a Dorr engineer explain the Dorr System to you. Write the nearest Dorr office, there is no obligation.

DORR

RESEARCH ENGINEERING EQUIPMENT

ADDRESS ALL INQUIRIES TO OUR NEAREST OFFICE

DORRCO

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CITRIC ACID

Although demands continue to be heavy, our supply position is considerably improved. Users of Citric Acid will find us prepared to meet their normal requirements.

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The Purchasing Agent

—HE, TOO, HAS SERVED WELL

TOO frequently the accomplishments of Purchasing Agents and their staffs have been overlooked in discussions of American industrial might. In emphasizing production records, Purchasing achievements in providing raw materials often are omitted . . . in praising scientific and technical advances, the ingenuity of Purchasing men in locating and obtaining scarce products frequently is unnoticed.

Yes, through long hours of diligent, resourceful work, American industrial Purchasing Agents have turned in a superlative job. In paying tribute to them, Columbia renews its pledge of continued co-operation to its customers' Purchasing Agents and their staffs as they face today's new problems and responsibilities.

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Have you investigated the DEMINERALIZATION OF WATER?

EQUAL TO COMMERCIALLY DISTILLED WATER

LOWER IN COST OF EQUIPMENT

LOWER IN COST OF OPERATION

Write for a copy of publication 4181 describing the Cochrane Demineralizing Process.

OF greatest importance to manufacturers using clear water in manufacturing processes is the new method of producing water of the quality and characteristics of commercially distilled water by means of ion exchange.

Cochrane, leaders in water conditioning for well over half a century, after long experiment and test, have developed the Cochrane Demineralizer, which is in successful operation, delivering clear water equivalent to commercially distilled water.

The installation of the Cochrane Demineralizer offers opportunities for economies and improved products wherever there is need for mineral-free water.

WHERE THE COCHRANE DEMINERALIZER CAN SAVE MONEY AND IN MANY CASES IMPROVE PRODUCT

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- Textiles
- Wood

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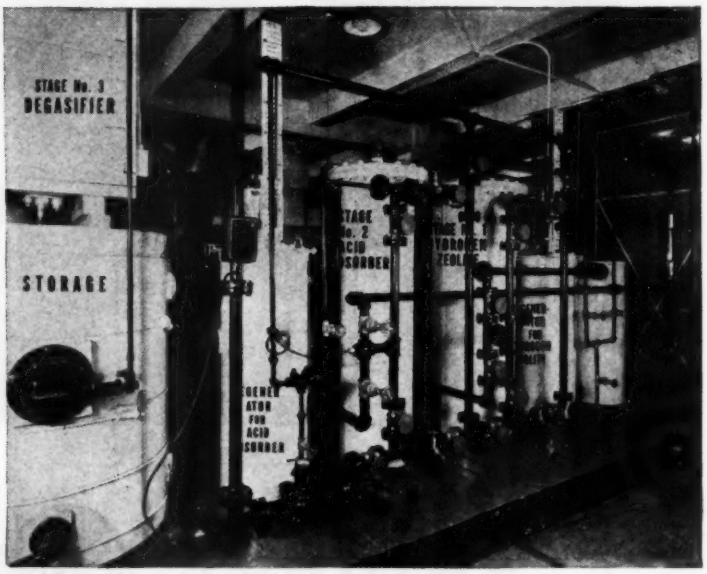
- Drinking



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COCHRANE

SOFTENERS · DEAERATING SOFTENERS · DEAERATORS · METERS · STEAM SPECIALTIES

FLIES GET STUCK...

...SO DO UNLUBRICATED VALVES

But NORDSTROM VALVES

turn easily Forever

THEY'RE LUBRICATED

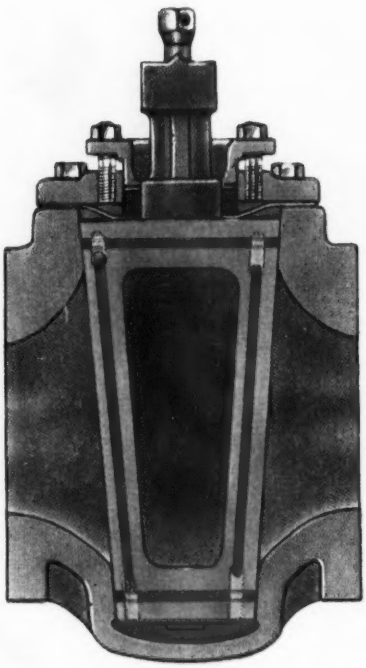
The valves with

POSITIVE ROTARY ACTION

--port sealed with pressure lubricant

Nordstrom Lubricated Valves are built on the tapered rotary principle. It is the simplest and most positive valve action known. The taper of the plug and seat maintains an intimate working contact between the two parts at all times. Since the valve is opened and closed by rotation only, and *not* by raising or lowering the movable valve member, the vital seating surfaces are self-protecting and self-cleaning. There are no pockets or recesses to collect sediment or scale deposits.

A stick of Nordco Lubricant, inserted in the shank of the plug, keeps the Nordstrom Valve in prime condition. It gives the vital lubrication required for long life, perfect sealing and easy turning of plug.



"Sealdport" grooves completely surround closed ports. In the above illustration the yellow areas indicate "tail" grooves in the body which connect with the vertical lubricant grooves in the plug, to form an unbroken circuit of pressure, regardless of position of the plug.

Full circumferential grooves are provided above and below ports. Lubricant enters unexposed long grooves in plug which lead directly to jacking chamber under plug. A few turns of the lubricant screw at top of plug forces lubricant through the grooves and lifts plug, if overly tight.

Basic sealing principle in all Nordstrom Valves

The details of groove arrangements vary somewhat in different styles of Nordstrom Valves. However, all of the systems have two things in common—supply of a complete film around closed ports and cut-offs of any exposed portions of the grooves. The vital need for lubricant is evident. No *un*lubricated valve can offer such a positive seal against leakage or equal certainty of easy turning. Nordstrom engineering principles insure most efficient operation regardless of conditions.

KEEP UPKEEP DOWN

Nordstrom LUBRICATED VALVES

Sealdport Lubrication

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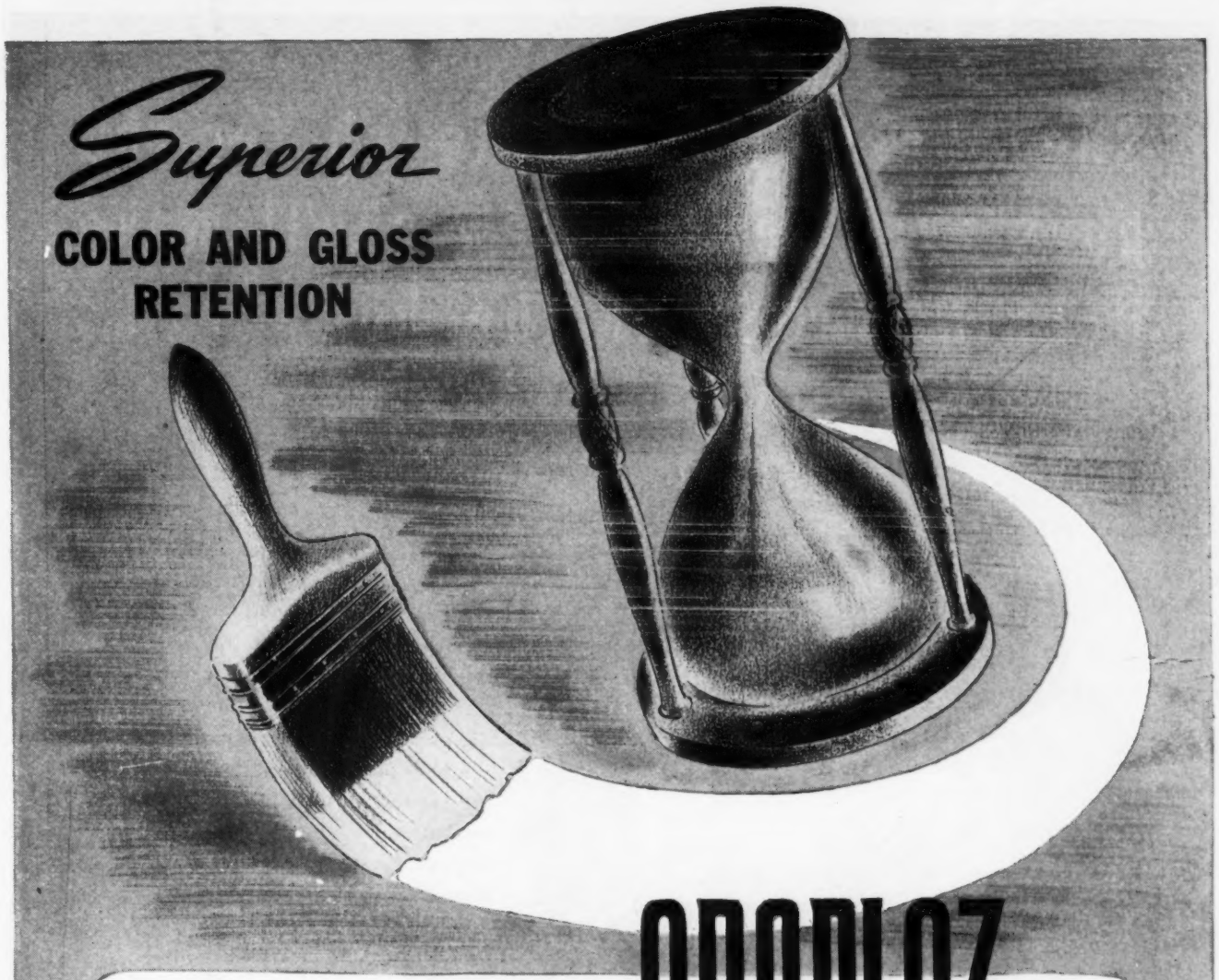

Superior

COLOR AND GLOSS RETENTION

WITH NEW S&W AROPLAZ 1241

Now available without restriction, S & W Aroplaz 1241 gives superior gloss and gloss retention, together with improved color retention and brushing properties. A long oil, pure, oxidizing alkyd resin, it is especially suited for use in architectural enamels, mill-gloss whites, marine finishes and exterior paints and enamels. Color and gloss-retention properties of S & W Aroplaz 1241 are outstanding, even after extended exposure. It can be blended with a wide variety of drying oils, varnishes and with other alkyds, with oil paints to speed drying, or with shorter alkyds to improve their brushing characteristics. Alone or extended with oils, it is an excellent trim and trellis paint vehicle.

For samples and further data, phone or write U. S. Industrial Chemicals, Inc.

SPECIFICATIONS

Solution in Mineral Spirits	69-71% N.V.
Viscosity (G. H.)	Y-Z_1
Acid Number (on plastic)	6-10
Color (G. H. 1933)	7-9
Wt/gallon at 25° C	8.05-8.15 lbs.

Solubility: Complete in petroleum and coal-tar hydrocarbons. Insoluble in ethyl alcohol. Compatible with a wide range of vegetable drying oils, varnishes and other alkyds.

U. S. INDUSTRIAL CHEMICALS, INC.

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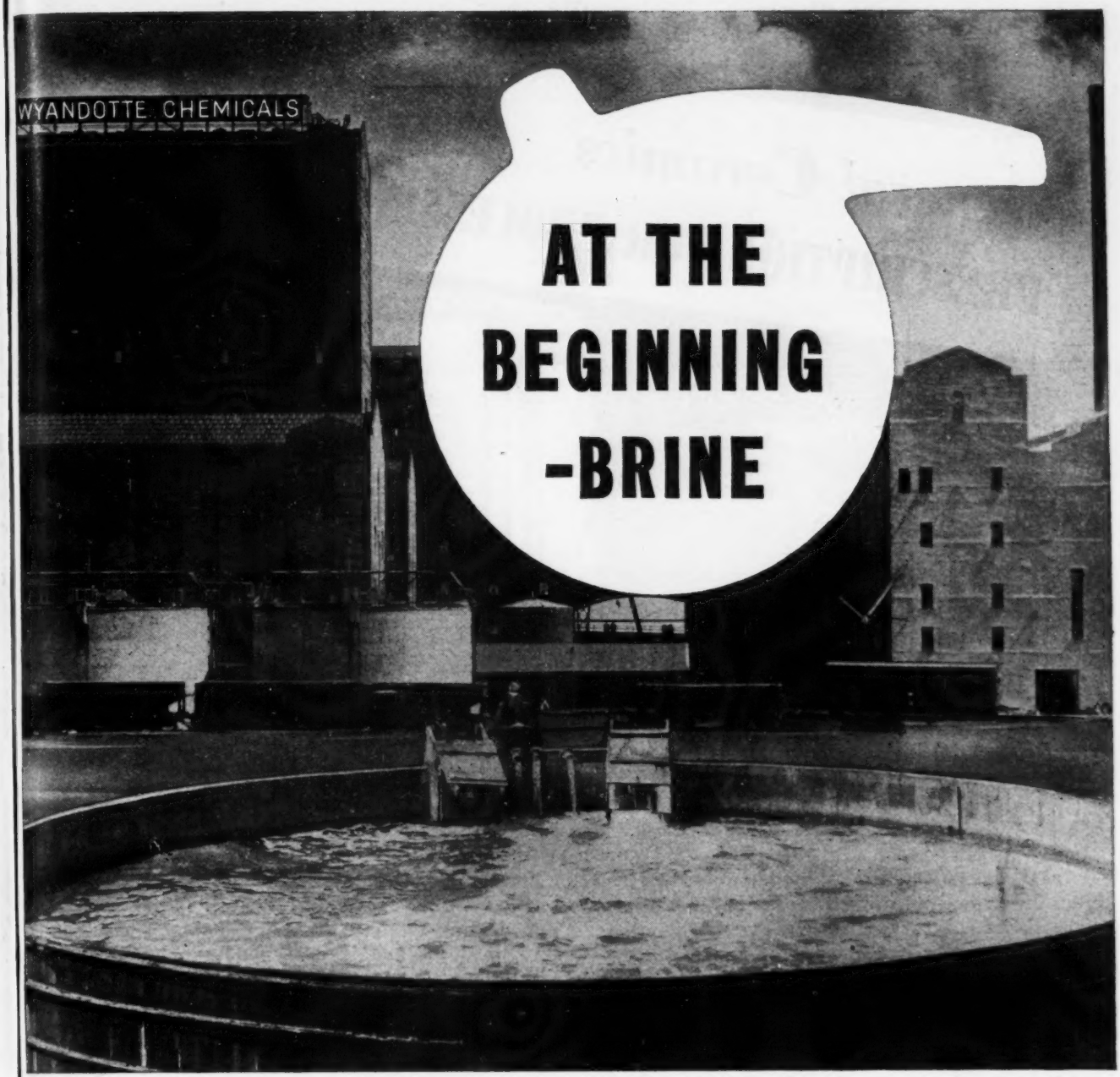
EVERYONE in the big Heekin organization salutes the women who stepped into the breach and produced the many war items in the Heekin factories . . . from bullets to ammunition boxes. These same experienced women are ready to take over the production of peacetime metal packages . . . in all shapes and sizes . . . in all colors. If you manufacture anything that goes into a metal package . . . and you know that metal packages carry your products safer and without loss . . . why not let one of us here at Heekin talk over your packaging problems? No inquiry too large . . . no inquiry too small . . . and no obligation.

Specialists in Metal Packaging

ANY SHAPE · ANY SIZE · ANY COLOR · ANY QUANTITY

Heekin Cans

THE HEEKIN CAN CO., CINCINNATI 2, OHIO



• Basic manufacturing material for the huge North Plant of the Wyandotte Chemicals Corporation at Wyandotte, Michigan, is salt brine. Into this storage tank it pours 24 hours a day every day in the year—from six wells some 1400 feet underground. Daily brine production of this one tank is in excess of 412,000 gallons.

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ONE OF THE WORLD'S GREAT PRODUCERS OF CHEMICALS

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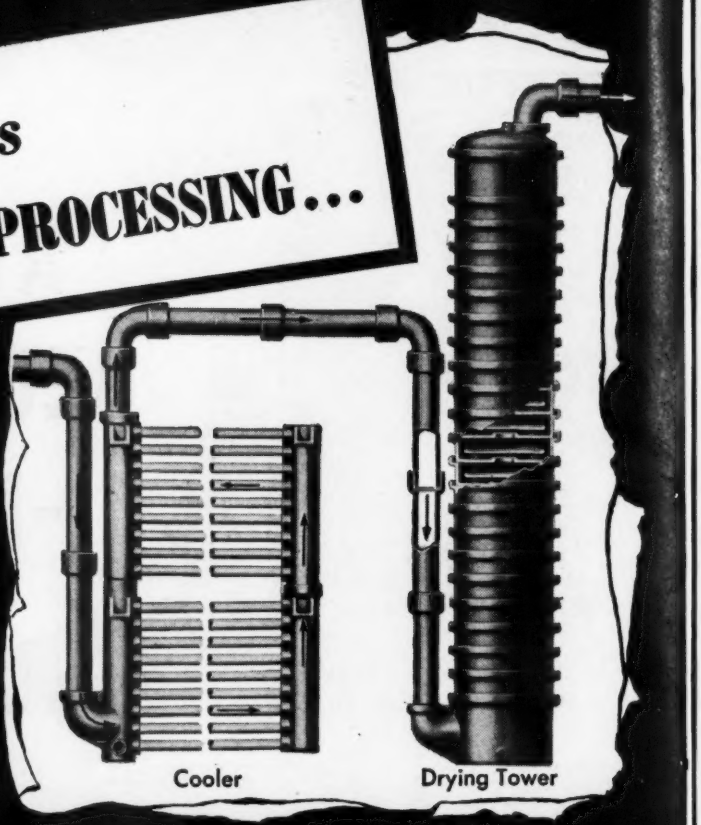
General Ceramics
PRESCRIPTION FOR PROCESSING...

Chemical Stoneware
Chlorine Coolers
and Drying Towers



GENERAL CERAMICS chemical stoneware coolers and drying towers have earned their place in the flowsheet for the manufacture of chlorine.

The cooler shown above is designed so that either one or a multiplicity of units, depending on the size of the installation, can be used. Either water or brine can be used as a cooling medium. The tubes are made of a special stoneware body having a high heat transfer co-efficient and greatly increased resistance to thermal shock.

The drying tower is of the cascade type and operates under counter current flow principles. Single pass operation with its consequent elimination of pumping can be used if there is only one tower in the installation. Towers are available in 12", 24", 30", 36", and 48" diameter and the number of plates per tower is limited only by structural considerations. Both pieces of equipment have received the stamp of approval by being specified for and used in the leading arsenals and chlorine manufacturing plants of the country. For further details send for General Ceramics Bulletin "A".

General Ceramics & Steatite Corporation, Chemical Equipment Division, offers this apparatus as but one example of its service to the process industries. Our Engineering and Design Department is ready to cooperate with you on the design and applications of this or any of our other standard and special items.

566

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COMPOUND *Chemical Formula*	Mol. Wt.	M.P. °C	B.P. °C (760 mm)	Solubility W	A	E
Furfural $C_4H_3O \cdot CHO$ Yellow liquid	96.08	−36.5	161.7	s	s	∞
Furfuryl Alcohol $C_4H_3O \cdot CH_2OH$ Amber liquid	98.10	−31	171 (750 mm)	∞	∞	∞
Hydrofuramide $(C_4H_3O \cdot CH)_3N_2$ Light brown crystals	268.26	117	250 dec.	i	s	s
Tetrahydrofurfuryl Alcohol $C_4H_7O \cdot CH_2OH$ Colorless liquid	102.13		170 to 180	∞	∞	∞
Tetrahydrofurfuryl Oleate $C_4H_7O \cdot CH_2OOC(CH_2)_7$- $CH{:}(CH_2)_7CH_3$ Yellow oily liquid	366.5		200 to 285 (16 mm)	i	s	s

EXPERIMENTAL QUANTITIES

*Ethyl Furylacrylate $C_4H_3O \cdot CH{:}CHCOOC_2H_5$ Colorless liquid	166.17	24.5	132 to 133 (18 mm)	i	s	
Furan C_4H_4O Colorless liquid	68.07		32 (758 mm)	i	s	s
*Furfural Acetone $C_4H_3O \cdot CH{:}CHCOCH_3$ Red brown liquid	136.14	37 to 40	229 dec.	i	s	s
*Furfural Acetophenone $C_4H_3O \cdot CH{:}CHCO\,C_6H_5$ Yellow, oily crystals	198.21	39 to 42	178 to 181 (8 mm)			
*Furfural Diacetate $C_4H_3O \cdot CH(OOCCH_3)_2$ Colorless crystals	198.17	50 to 51	220	i	s	s
*β-Furfuraldoxime $C_4H_3O \cdot CH{:}NOH$ White crystals	111.10	88 to 90	201 to 208	sl.s.c.	s	s
*Furfuryl Acetate $C_4H_3O \cdot CH_2\,OOCCH_3$ Colorless liquid	140.13		84 to 85 (25 mm.)	i	s	s
*5-Furfural-2-Thiohydantoin $C_4H_3O \cdot CH{:}\,C_3H_2N_2OS$ Green crystals	194.20	250 to 252 (247 dec.)				
*Furil $(C_4H_3OCO)_2$ Yellow needles	190.10	161 to 162		i	s	s
*α-Furil Dioxime $(C_4H_3O \cdot C{:}NOH)_2$ Light tan powder	220.18	164 to 168			s	s
*Furoamide $C_4H_3O \cdot CONH_2$ White powder	111.10	141 to 142	(some subl. 100°)			
Furoic Acid $C_4H_3O \cdot COOH$ White Crystals	112.03	131 to 132		s	s	s
*Furoin $C_4H_3O \cdot CHOHCOC_4H_3O$ Light brown needles	192.16	135 to 137		i	s	s
*Furoyl Chloride $C_4H_3O \cdot COCl$ Colorless liquid	130.53	−2 to 0	176	dec	s	s
*Furylacrolein $C_4H_3O \cdot CH{:}CHCHO$ Yellow crystals	122.12	51	200	i	∞	s
*Furylacrylamide $C_4H_3O \cdot CH{:}CHCONH_2$ Light tan crystals	137.13	167 to 168		i		
*Furylacrylic Acid $C_4H_3O \cdot CH{:}CHCOOH$ White crystals	138.12	141	226; 117 (8 mm)	i	s	s
Methyl Furan $C_4H_3O \cdot CH_3$ Colorless liquid	82.10		62 to 63	i	s	s
Tetrahydrofuran C_4H_8O Colorless liquid	72.10	−65	66	∞	∞	∞
*Tetrahydrofurfuryl Acetate $C_4H_7O \cdot CH_2OOC \cdot CH_3$ Colorless liquid	144.17		84 to 86 (14 mm) 91 to 92 (16 mm)	i	s	s
*Tetrahydrofurfuryl Adipate $(C_4H_7O \cdot CH_2OOC)_2$- $(CH_2)_4$ Yellow liquid	314.37	5 to 15	200 to 207 (1.5 mm)	i	s	s
*Tetrahydrofurfuryl Benzoate $C_4H_7O \cdot CH_2OOCC_6H_5$ Colorless liquid	206.23		143 to 145 (3 mm)	i	s	s
*Tetrahydrofurfuryl Palmitate $C_4H_7O \cdot CH_2OOC$- $(CH_2)_{14}CH_3$ Colorless liquid	340.53		195 to 19 (1.5 mm)	i	s	s
*Tetrahydrofurfuryl Propionate $C_4H_7O \cdot CH_2OOC \cdot C_2H_5$ Colorless liquid	158.19		100 to 102 (18 mm)	i	s	s
*Tetrahydrofurfuryl Salicylate $C_4H_7O \cdot CH_2OOC \cdot$ C_6H_4OH Colorless liquid	222.23		131 to 133 (2 mm)	i	s	s

W = Water, A = Ethyl Alcohol, E = Diethyl Ether

NOTE: *Substituent groups in the Furan Ring are in the "2" position unless otherwise indicated.*

Inquiries for compounds marked * should be sent directly to the Eastman Kodak Company, Rochester, New York. Samples of the others are available to those who see in them a possible application to their problems. Company letterhead should be used when writing.

Further information on Furfural and other Furan chemicals will be furnished upon request. In asking for information, please give us as many details about your problem as you can. We can then give you more specific and pertinent information about the Furans as applied to your particular needs.

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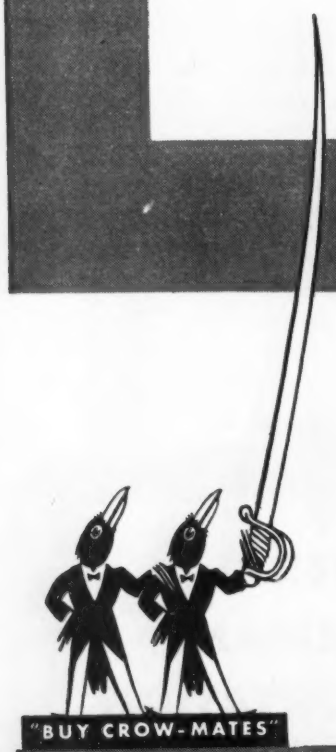

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Tools for the Job Ahead

by ROBERT L. TAYLOR, editor

As CHEMICAL INDUSTRY EMBARKS upon the task of helping supply the accumulated peacetime needs of the country, it finds itself with some new tools and new materials that it did not have when it last was able to devote its full efforts to producing "better things for better living."

In this issue we have attempted to bring together for CHEMICAL INDUSTRIES readers a summary of significant developments over the past three or four years, as well as current outlooks where possible, in the fields of chemical materials, chemical processing equipment, chemical packaging and shipping, and chemical manpower.

In gathering this information, the editors have found it interesting to note that while the wartime accomplishments of both the chemical industry and the process equipment industry were great, and while ingenious methods were used to meet every requirement of the military, yet very little that involves basically new properties or basically new design has been introduced during the war years in either chemicals or equipment. Indeed the most significant developments have been in new applications and adaptations of existing materials, principles and designs.

This is not to minimize those useful things and techniques that have been brought forth in the line of war duty, for there are many of them as the records on the following pages show. But it does seem to be another indication that while ingenuity and resourcefulness may flourish, true creativeness does not thrive under war conditions.

Among the greatest wartime strides affecting the chemical industry have been those made in the bulk packaging field, including new packaging materials, new package designs, and new and more efficient methods of handling and shipping. Cheaper and better bulk packaging is already in effect in many chemical lines as a result of wartime experience. Container manufacturers are meeting this new appreciation of the importance of their products with intensified efforts toward even better servicing of the chemical industry's special problems.

Technical manpower received a setback during the war from which it will not recover for many years. There is no chance of anything like a sufficient supply of chemists and chemical engineers for at least five years. Meanwhile, however, the colleges are preparing to return to their prewar high requirements for entrance and graduation in technical courses. The trend, in fact, appears to be in the direction of even higher standards than obtained before the war, so that although the quantity of graduates will remain small for some time. the quality promises to reach progressively higher levels.

We invite you to read further into the pages of this issue for an up-to-date picture of wartime developments and trends in materials, machines and men. These reports represent many hours of effort by the authors and editors to bring this important information to you in concise and accurate form. We hope they will prove useful in solving many practical problems in the chemical job ahead.

Evaluation of German Data

MUCH FANFARE HAS ACCOMPANIED the capture of German chemical information by the various technical missions that have gone into the country for that purpose since the surrender. These committees have come back with reams of material, much of which has not yet even been sorted or evaluated. Of that which has, which is probably a representative sample, much has been of interest, some has been of value to industry in this country, but most has been of no practical benefit.

There seems to be an impression among the public, apparently gathered from reports in the popular press, that Germany was ahead of this country in many chemical lines. To some extent this was true, but in virtually every case where it was, she was ahead because there was no need for similar development in this country. Most of her highly developed acetylene chemistry, for example, grew out of the fact that she had no petroleum or natural gas as sources of hydrocarbons. In the United States, where there are ample supplies of these raw materials, acetylene processes are of much less interest and value.

Thus it must be kept in mind, both in giving credit and in evaluating captured data, that the German needs were different, the economics were different, and the materials they had to work with were different. The German data should be evaluated carefully and soberly as far as their worth under U. S. conditions is concerned. Indications are that most of the material of immediate value will be found in the form of details

and techniques which can be applied in already established American operations, rather than in radically new products and processes.

Tighter Patent Policy

SEVERAL PRIVATE REPORTS emanating from the U. S. Patent Office are to the effect that the new Commissioner, Casper W. Ooms, is making his presence felt in a determined and constructive manner. Members of the Office's large staff, headquartered at Richmond, Va., apparently have not been in the habit of receiving frequent visits from their boss in Washington, so that the new director's weekly calls (Thursday has become "Oomsday" in the Patent Office) are said to be injecting a stimulant into the organization.

The new commissioner's major change in policy, it appears at present, will be to shift emphasis more in the direction of quality and away from quantity in the granting of patents. He believes that the Office has been too liberal in the past in allowing claims which were not clear cut and which overlapped others already in existence. If carried out, the step will mean fewer patents and less litigation. The reform is one which if administered uniformly and not to extremes should be welcomed by industry as good riddance of a source of much needless legal expense.

How Bright Is the Export Picture?

UNITED STATES EXPORTS of industrial and coal-tar chemicals in 1944, including lend-lease, have been reported at $131,000,000. This is a four-fold increase over the 1936-1939 average for this group.

There appears to be much sentiment in the industry to the effect that the war has ushered in a new golden age for chemical exports. Wartime gains in the world markets will not only be maintained but will be extended, we are told from many sides.

There is good reason for this feeling. With Germany out of the picture the way is open for expansion of U. S. chemical trade in South America, Europe and the Far East. There is an accumulated demand for peacetime goods in foreign countries, just as at home. American prestige has risen abroad as a result of our wartime production record.

But amid all these hopeful signs there is an ominous note, one that may even turn out to be rather large and ugly in time. U. S. exports have been far oustripping U. S. imports, despite far flung buying of raw materials during the war. In many fields, as in chemicals, exports have sky-rocketed while imports have declined. Such conditions do not provide dollar exchange, and plenty of dollar exchange will be needed to maintain the flow of goods that has been going out of the country during the last four years under lend-lease.

Estimated dollar balances of 3 billion in South America, 1.5 billion in France, and a sizable figure in Sweden, look large compared with our prewar trade with these countries. But they shrink considerably when placed alongside total U. S. wartime exports, for which they, as some of the principal postwar dollar sources, will have to provide much of the peacetime replacement markets. Moreover, as these balances are drawn upon, they are not likely to be replaced rapidly, and therefore they cannot be regarded as permanent. U. S. loans may be granted to some countries that are most badly in need of reconstruction, but this again cannot be regarded as a continuing policy.

The export picture appears bright enough for a year or two, but beyond that it is far from clear. Chemical manufacturers interested in foreign markets should be sure to give careful consideration to all sides of the picture in making their long term plans.

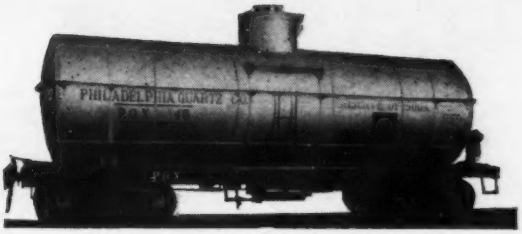
There Is a Middle Ground On Government Research

WE WERE STRUCK BY ONE THING in the results of the Smaller War Plants Corporation's recent survey of what businessmen think about Federal support of scientific research and development in peacetime: With few exceptions the more than 200 manufacturers interviewed aligned themselves either with the government-keep-out-entirely group or with the-more-government-research-the-better faction. Hardly a handful took any position in between.

The public interest can best be served by neither of these two extreme positions. We would be among the last to say that government should take over the research function for industry or for any part of industry, large or small. But the time does seem to have arrived when the public welfare and security rest to a very large degree on scientific progress, and as every scientist knows, the kind of scientific progress that satisfies material human needs can spring only from a constantly flowing well of fundamental, nonpractical (in the direct profit sense) scientific knowledge. It is in the job of maintaining this flow of basic information that government support could serve both industry and the public. No competitive advantage would accrue to any single industry group, yet all would benefit. Private industry would continue to carry on in its traditional role of applying this fundamental knowledge to the job of satisfying the public needs and interests.

It will be impossible to establish and operate effectively such a middle ground policy of Federal research, however, unless laymen, politicians and many businessmen have a clearer understanding of the important difference between basic and applied research. Congress and the public must be educated to the fact that Federal grants for basic research cannot show directly attributable results in the form of new products. If Congress should take the position that they must, in order to be renewed, the program will either die for want of funds or we will find government in competition with private industry on a scale that will make any present tendencies in that direction look puny by comparison.

Here is a job of education in which every member of chemical industry should take a personal part.



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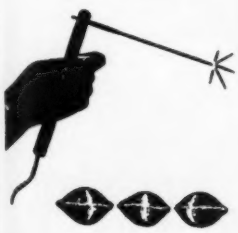

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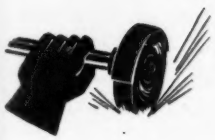

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Photo courtesy of Monsanto Chemical C

Much pilot plant work is going ahead on products and processes that will soon be ready for commercial production.

Chemical Industries
NOVEMBER, 1945

WHAT'S AHEAD For the American Chemical Industry?

AS AN INDUSTRY, we look to the future with enthusiasm for the task of translating the opportunities before us into services which will benefit all citizens. We do not anticipate a retreat from our goal of fulfilling the needs of a public that takes much for granted and progressively expects greater fulfillment measured by past successes.

by H. L. DERBY
President
Manufacturing Chemists' Association
of the United States

THE influence of applied chemistry on every-day living—in food, shelter, clothing and health—has never been more completely demonstrated than in the fateful period beginning December 7, 1941, and ending August 14, 1945. The climaxing factor of this conflict—the use of the atomic bomb—was in itself the ultimate demonstration of the force of applied chemistry and physics in shaping the world we live in. World War II was the means of accomplishing within the space of a few years a generation of peacetime development, emphasizing the position of chemical manufacture as a key industry, essential in peace as well as in war, for the health, prosperity, and progressiveness of the nation.

War-born uses for synthetics, plastics, protective coatings, synthetic fibers, and development of new medicinals, have given our people as a whole a fuller realization of the role played by chemicals in the processing and fabrication of virtually every article used in this war. They have come to realize that chemical synthesis has contributed to the comfort and health of our men on the fighting fronts, particularly those in the South Pacific, through the development of moisture proofing, mold resistant and vermin repellent materials, special coating processes for water and flame proofing tentage and wearing apparel, and for preserving food against spoilage in the tropics and in landing operations. More importantly, they have come to know the miraculous properties of synthetic medicinals, such as the sulfa group, penicillin, anti-malarials and vitamins, which were partly responsible for reducing the fatalities resulting from battle wounds in this war to a fraction of those suffered in World War I.

The expectancy of the public to benefit by these wartime developments, in their application to civilian uses and improved techniques, creates a challenge which the industry must and shall meet. Much laboratory and pilot plant work has been completed on processes and products which are all but ready for commercial fabrication. Many new chemical products which heretofore have not had peacetime utilization will be available. New fibers, developed to meet war conditions, will give greater and more useful service in civilian life. Opportunities for improved packaging and for many new and convenient uses in the home will be opened by the treatment of paper with new melamine resins, whereby it is made impervious to moisture by one process, and its wet-strength is greatly increased by another.

The farmer will find that he is both a producer and a user of chemicals to a greater extent than ever before when he sees corn converted to alcohol and synthetic rubber, his apples turned into a glycerine substitute, and his sweet potatoes into starches. In turn, he will be able to purchase new and more efficient chemicals for the growth and protection of his crops and livestock.

During the war, we have learned a great deal more about new chemo-therapeutic products, and broad developments in the field of medical and chemical

science may be applied for the prevention or cure of many diseases and infections, and to bring numerous health hazards under closer control.

A recent study completed by the Committee for Economic Development, composed of business men and industrialists who organized a number of years ago to plan for the conversion of the American economy to peacetime pursuits with the least possible dislocations, includes an analysis of postwar markets for manufactured goods in the first full postwar year after reconversion. This analysis estimates that the value of manufactures in the chemical and allied products industry will be 58.2% greater in 1947 than at the 1939 level; a 132.9% expansion is predicted in rayon and allied products; production of plastics is forecast at 161.6% of the 1939 base; fertilizer production is estimated at 51.9% higher than 1939; and chemicals not elsewhere classified, including synthetic rubber, are expected to rise in value by 76.4%.

The Tariff Commission in a recent study entitled "Postwar Import Trade and Production," estimates that, on a long-term basis, production of synthetic resins will increase about 10 times over 1939; that the output of coal tar intermediates may be expected to increase approximately 60%; that finished coal tar products may reach 650 million lbs., or a 50% increase over 1939; and that medicinal preparations will have a value of $39 million as compared with $28.5 million in 1939.

Increased Possibilities for Employment

The prospective increases in production indicated by these studies, and the larger markets they portend for chemical products, are directly related to increased possibilities for employment. The potential peacetime uses for synthetic resins and plastics are constantly increasing, and it is estimated that in this field alone the number of employees required may reach a figure three times greater than in 1939. In synthetic organic chemicals generally, with a substantially expanded production, employment is estimated at about ⅓ above the 1939 level.

In this connection, the rates of pay and annual income of workers in the chemical industry have been consistently above the average for industry as a whole. As an example, the average weekly earnings in all manufacturing in 1944 were $46.08, while for chemicals the average was $51.65; the average hourly earnings in 1944 were $1.019 and $1.105 for all manufacturing and chemicals, respectively.

A vital factor which is reflected in many ways, including the ability to provide fuller employment opportunities, is the research program of the chemical industry. Research is its outstanding characteristic, and no other industry depends more on investigation and technical development for its progress. Individual manufacturers are compelled to keep abreast of the newest and most efficient methods of manufacture, in the development of new products, and in the improvement of existing processes if they are not to be left behind in the competitive struggle for markets. This is especially keen in the chemical industry, not only between manufacturers of the same product, but, more notably, in inter-commodity competition.

One outstanding feature of the industry's research program has been its technical service to customers. This service involves instruction in the use of chemical products, introduction of new methods, study of customers' needs, and extending assistance in the enlargement of their own production opportunities. New products coming on the market in the postwar period emphasize the need for more detailed instruction and information concerning their technical and safe use and protection from inherent hazards. The program of the industry has for many years included the development of containers for safe handling and transportation of hazardous chemicals, the development of product label cautions to adequately warn both users and handlers of such chemicals, and recently the preparation of safety data sheets which contain detailed information covering safety measures and precautions.

A large percentage of the income from sales of chemicals is used for research. On the basis of a prewar survey, research expenditures of the chemical industry were 3.3 percent of sales as compared with 0.2 percent of total sales of all industry. The chemical industry utilized over 20 percent of the total research employment of the United States before the war.

One of the by-products of the industry's research program, resulting from technical efficiency and lower costs, has been the relationship of chemical prices to those for all manufacturing industry. Price indexes for June 1945, based on Bureau of Labor Statistics data, using 1926 as 100, show that, despite the general upward trend of costs both on raw materials and labor, wholesale prices of chemicals in that month were 95.9 as compared with 99.6 for all commodities except farm products and foods.

Technical Personnel Problem

In this connection, the industry is threatened with serious constriction in the postwar period in the loss of its scientific personnel. It has been estimated authoritatively that the deficit of science and technology students who, but for the war, would have received bachelor's degrees is about 150,000, and that the cumulative deficit will continue and grow until several years after the war. In the field of chemistry alone, probable deficits of Ph.D.'s 1946 through 1955 are set at 4,500, and the total probable deficit due to the war, 1941 through 1955, is estimated at 5,200. Nobel Physicist Arthur H. Compton has termed this deplorable situation as "scientific bankruptcy," and other national leaders have pointed to the fact that neither Russia nor Britain allowed the war to deplete their "stockpile" of human research material for the postwar future.

In the United States—despite all the efforts which were made during the war to secure deferment of

necessary technical and scientific workers in the chemical industry (a large percentage of them in the vulnerable under-26 age group)—draft policies drew all but a very small residue. The shortage of skilled men, critical during the war period when maintenance of production schedules was threatened, has been intensified rather than relieved by the ending of hostilities. The problem now is one of long-range national scientific development as well as short-range reemployment objectives. Demobilization policies, as well as continued inductions, promise little hope of adequate technical manpower supplies seriously needed in the immediate period for productive and development work which would result in providing jobs for the thousands of returning non-technical veterans who were drafted earlier than the highly trained workers deferred on war jobs, and who consequently are being released earlier.

The chemical industry requires a pioneering, path-finding, professional, technical group normally numbering from five to ten percent of the industry's total employment. This group is the source of the ideas and developments which permit employment of the other ninety-odd percent. In round numbers, 20,000 technologists make employment for several hundred thousand other chemical workers; can help to continue employment of veterans; and are a key to the employment prospects of a roughly estimated 4 million in occupations which depend on the chemical industry for raw materials and technical servicing.

Unstabilizing Factors

While the conversion problem of the chemical industry is relatively simple, and does not approach the complicated process necessary, for example, in the automotive branch where war equiment must be removed and old specialized equipment restored, the ability of the industry to continue its expansion in the postwar years and to provide greater opportunities for employment, is hedged with a number of uncertainties, of which the shortage of scientific manpower has already been mentioned. We face the retarding effects of labor unrest, strikes, and broken contracts. A stabilized labor policy, and a wage policy related directly to productivity, is urgently necessary if industry planning and growth are to be fully accomplished. We face the unstabilizing factor of continued exorbitant Federal spending, and a tax policy which discourages investment of venture capital in new enterprise. A recent authenticated analysis of the return to investors in designated income brackets from an investment in a hypothetical corporation organized with $4 million paid-in capital, indicated that an investor with a $15,000 income, would earn (after Federal Income Taxes) 1.8% on his investment if the enterprise earned 6%; 3.0% if the earnings were 10%; and 6.79% if the earnings of the enterprise were 50%. An investor with a $200,000 income would earn 0.216% (1/5 of 1%) at the 6% earning of the enterprise; 0.36% (1/3 of 1%) at the 10% level; and 0.815% (4/5 of 1%) at the 50% level. These returns on risk capital, with which the more favorable returns from tax-exempt or municipal securities are in competition, indicate the necessity for a change in the tax system to encourage venture capital in new, job-producing enterprises.

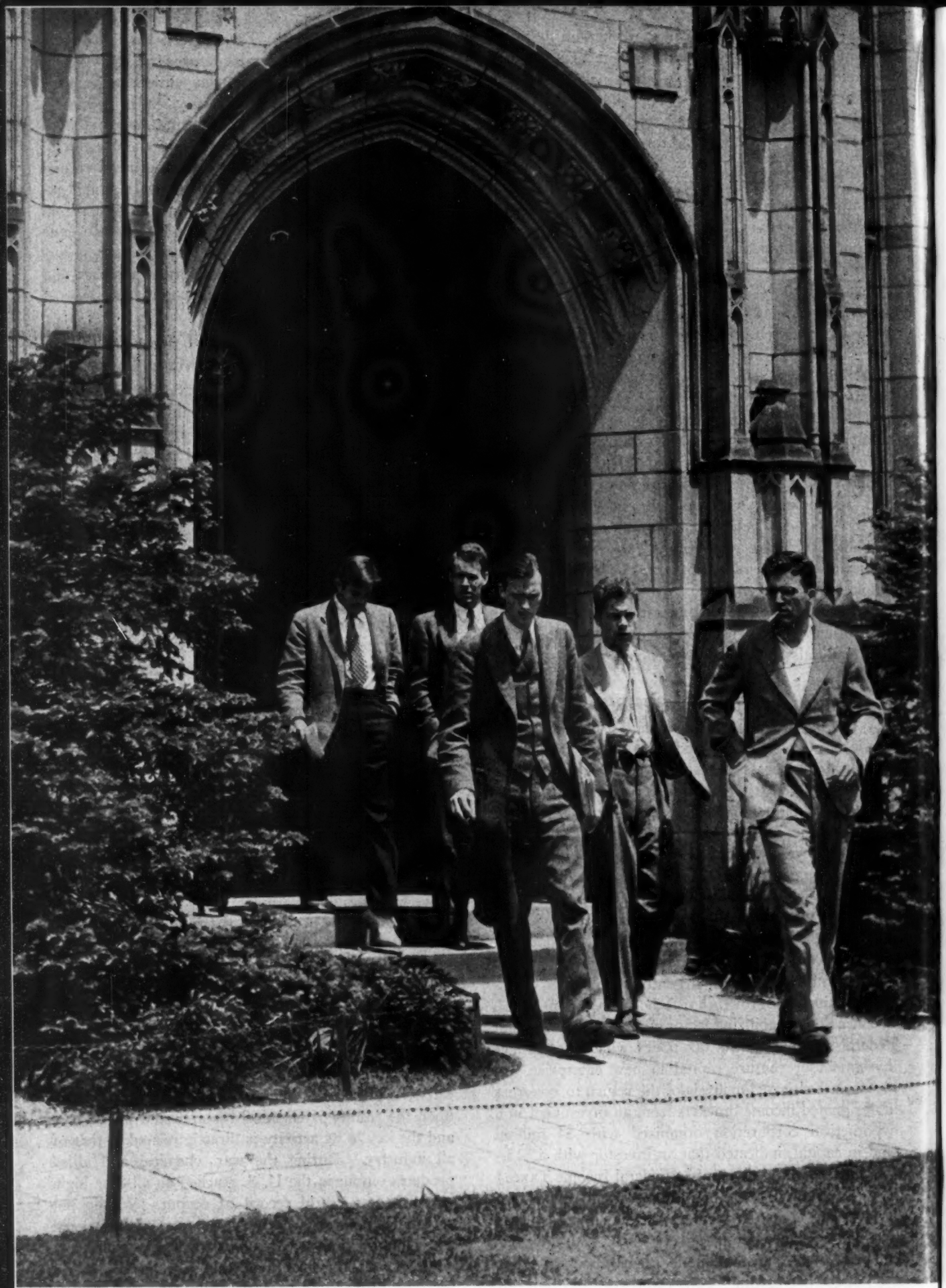
Uncertainties as to the attitude of the Bureau of Internal Revenue regarding deduction of research and development expenses are a deterrent to research expenditure. Quoting from Dr. Bush's famous report on *Science, the Endless Frontier:* "The Internal Revenue Code should be amended to remove present uncertainties in regard to the deductibility of research and development expenditures as current charges against net income."

Government and Industry Must Cooperate

Other obstacles relate to uncertainties with regard to the disposition of wartime government-owned chemical plants, and the question of their operation by private industry or by government; to proposals currently being heard in Congressional committees on the federalization of research; to future policies relating to the patent system now under study by a special committee appointed by Secretary of Commerce Wallace at the request of the President; and to recommendations for a national fertilizer policy, involving nationalization. In these uncertainties is involved a fundamental decision: the continuance and growth of our private enterprise system, or the expansion of a controlled or socialized economy.

Elimination of these uncertainties depends upon the friendly and cooperative attitude of government toward business, and on its determination to effect sound fiscal and legislative policies which will encourage and speed reconversion and expansion of private enterprise. To this end, industry leadership can be most helpful through the study of legislative proposals and their possible impact upon business, and the proffer of enlightened advice and assistance to our representatives in Congress and to the administrative and executive branches of government.

As an industry, we look to the future with optimism and enthusiasm for the task of translating the opportunities before us into services to humanity which will benefit the lives of the millions of our citizens. An industry which takes as its raw materials the products of the earth, the farm and forest, the air and water, and converts them into useful products to serve human needs, cannot go in any direction but forward. Its full strength lies in the reliance of other industries upon the results of chemical research and production, and the key to its activity is directly related to that of all industry. During the war, chemical and allied products output in the U. S. reached an all-time high, establishing a world record of output. We do not anticipate a retreat from this goal in analyzing national needs and the desires of a public which takes much for granted in the benefits conferred by American chemical ingenuity and progressively expects greater fulfillment measured by past successes.



(Illustration Courtesy Yale University News Bureau)

Scenes like this, of students leaving an examination, are becoming more and more frequent as men return from the battlefield to the classroom.

Chemical Education Plans for Postwar

PEACE BRINGS AN IMPROVEMENT in the outlook for both quality and quantity of chemical manpower. College chemistry and chemical engineering departments are completing plans for increased enrollments and higher standards for degrees, but the flow of new technical talent into industry probably will not reach its prewar rate for five years.

TO GIVE READERS a picture of the present situation and outlook for resuming the flow of new chemical manpower into industry from the colleges, CHEMICAL INDUSTRIES presents on this and following pages the results of an editorial survey based on interviews with leading chemical educators and replies to a mail questionnaire. Addressed to the heads of chemistry and chemical engineering departments of colleges on the accredited lists of the American Chemical Society and the American Institute of Chemical Engineers, the questionnaire drew answers from a significant majority.

Several trends seem to be taking shape in postwar chemical education plans. These include an increase in control of electives, a strengthening of basic courses such as English and mathematics, and a tendency toward lengthening of the programs in chemical engineering. The accelerated programs are definitely out. Only about ten percent of both the chemistry and chemical engineering departments plan to continue them after next summer.

Present enrollment figures emphasize the contrast between the number of chemistry and chemical engineering graduates in June 1941 and the probable number of graduates in 1946. Anywhere near the prewar flow of graduates probably will not be attained before 1949 or 1950. The increase in the proportion of women in chemical classes is considered a temporary wartime condition only. Interest in graduate study in chemical engineering appears to be markedly increasing, as evidenced by the fact that, although small, the number of candidates for the master's degree in this department is now about the same as the number in the chemistry department. During the war the proportion of all graduate students increased because of the depletion of undergraduate ranks. The number of fellowships is increasing, due in part to an increase in industrial sponsorships, although many institutions report that they are still unable to fill all of the fellowships which they now offer.

The return of war veterans is slowly bringing the enrollment in chemistry and chemical engineering departments back to prewar levels. These men can turn to veterans' bureaus, advisors, committees, and the like for counselling and help in both personal and academic matters. Two out of three engineering departments are planning survey or refresher courses, while probably only half of the chemistry departments will make this offering. At some schools precollege level courses will be available, while at others veterans will be allowed to audit subjects without cost.

CURRICULAR TRENDS

AS THE chemistry and chemical engineering departments in colleges and universities all over the country change over from wartime accelerated programs to normal schedules, several trends in educational thinking seem to be taking shape. The majority of chemical engineering courses have already been altered to a small degree, most of them in keeping with the tendency toward strengthening of "general education." Some have returned to the prewar five year course. Many are making plans to switch from four to five-year programs after the unnatural wartime confusions are clarified. In the chemistry departments, where fewer shifts are reported, the new programs will increase the general background and add to the scope of advanced work by strengthening courses in such newly developed fields as nuclear chemistry.

EXISTING CURRENTS

Mentioning the comments recently set forth by Harvard University concerning the abolition of the free elective system, the CHEMICAL INDUSTRIES survey asked educational institutions whether the trend is toward more rigid control. Chemistry department answers fell into three categories; one third said yes, one third stated that control was already strict, and the remainder reported no change. A quarter of the chemical engineering departments are moving toward more direction of electives, while forty per cent say that they have it already. The remaining third are making no changes in prewar curricula.

Harvard also has proposed a strengthening of subjects in "general education," not restricted to a special field. Thirty-one per cent of the chemistry department heads reporting either increased their requirements in general education or are making plans to do so. Eighteen per cent claim that their demands are already high. No changes were reported by forty-eight

per cent. Of the chemical engineering departments, seventy-two per cent have either expanded requirements or plan to; fifty-seven per cent of these have already taken action. Thirteen per cent replied that general education was already generously covered, and thirteen per cent have made no curricular changes.

FUTURE TIDES

Leading educators seem to agree that the most important function of scientific institutions is to equip students with basic disciplines. Industry prefers men who have all the tools, and have in addition the "horse sense" and initiative which comes of applying brains to a problem, rather than considering it only from a theoretical standpoint. Therefore, schools are checking to ascertain the sturdiness of the keystones. Some mathematics requirements have been tightened. The imminent trend, according to R. Harding Bliss of the Yale chemical engineering staff, is a strengthening of basic subjects during undergraduate study, with specialization following. It has been pointed out that these undergraduate years give only enough time for the elementary subjects.

Man's body of scientific facts has increased tremendously in the last fifty years. There is much more to be taught now. As lengthening the college years does not appear advisable, many educators are leaning toward the raising of educational standards in secondary schools. This does not mean necessarily that the courses should be changed; it might properly be accomplished by more careful control of elective subjects. For example it is pointed out as desirable that students entering engineering be sufficiently well grounded in mathematics to take calculus in their freshman year. This in fact is already a requirement at M. I. T. and is under discussion at several of the leading universities. The need for better basic training in English is also frequently mentioned. The colleges state that there simply is not time in chemistry and engineering courses to go back and teach men to write reports, to punctuate, to spell, and to organize their thoughts on paper.

THE ACCELERATED PROGRAM

Without exception, heads of chemistry and chemical engineering departments agree that the accelerated program proved less satisfactory than the normal course. Here is a summary of their objections to this "necessary evil":

1. It exhausted students and faculty. "Low-average men were swamped by the pace."
2. Too much of the material "ran off." Even in the cases where men learned as much, they did not *know* as much. Time is required for facts to soak in: surface saturation, without proper penetration, seems to leave students unable to apply fundamental knowledge to unfamiliar situations. Lack of maturity is also manifested by the fact that the men are young in years when they graduate and have not developed socially nor acquired the same ability in judgment.
3. The speed-up regime leaves no break in the academic year for the men to gain practical experience. Besides stimulating enthusiasm for study, this taste of industry can be a definite aid in choosing a specific position toward which to aim.

Statistics from chemical engineering departments show that for the present academic year the accelerated program is being retained in a little more than half of the colleges. Forty per cent of the chemistry departments are operating under the accelerated plan. Replies from engineering department heads show that after this year, slightly less than a ninth of the colleges will continue the program, and probably for only one more year. All but a tenth of the chemistry departments plan to scrap it by the start of the fall semester in 1946.

PRESENT ENROLLMENT

Discussion of enrollment figures at the present time must necessarily be of a general nature, for under the accelerated program, semesters are jumbled and graduation dates scattered. Students are returning from the armed services in numbers and at times which are impossible for the schools to predict. This survey, after inquiring about undergraduate students, estimates that there were two and a half times as many bachelors' degrees granted by chemistry departments in June 1941 as will be conferred between February and June 1946. Chemical engineering departments granted four and a half times as many in 1941 as they will bestow next June.

WOMEN

In examining these data it should be recalled that the number of women studying chemistry has proportionately increased in all colleges, whereas the number of women in chemical engineering is still very small. With only one exception, chemistry department heads replied "yes" to the following statement and question: "Women have shown their influence on the chemical industry as an employment factor. Is the proportion of women students in your department greater than before the war?" When asked whether they expected this trend to continue as more men enter educational institutions, forty-three per cent answered the affirmative, while fifty-seven per cent disagreed. Several thought that the trend would continue for a short while, and then be reversed. Others volunteered the information that the outcome will be determined by the employment possibilities available for women.

The chemical engineers admitted ninety-four per cent strong that the proportion of women students had increased. They were much more skeptical about the future of women in their professions; in fact, twice as many stated that the trend would not increase, and many of the "yes-men" added that the trend would be short-lived or that the increase would be very slight.

GRADUATE STUDENTS

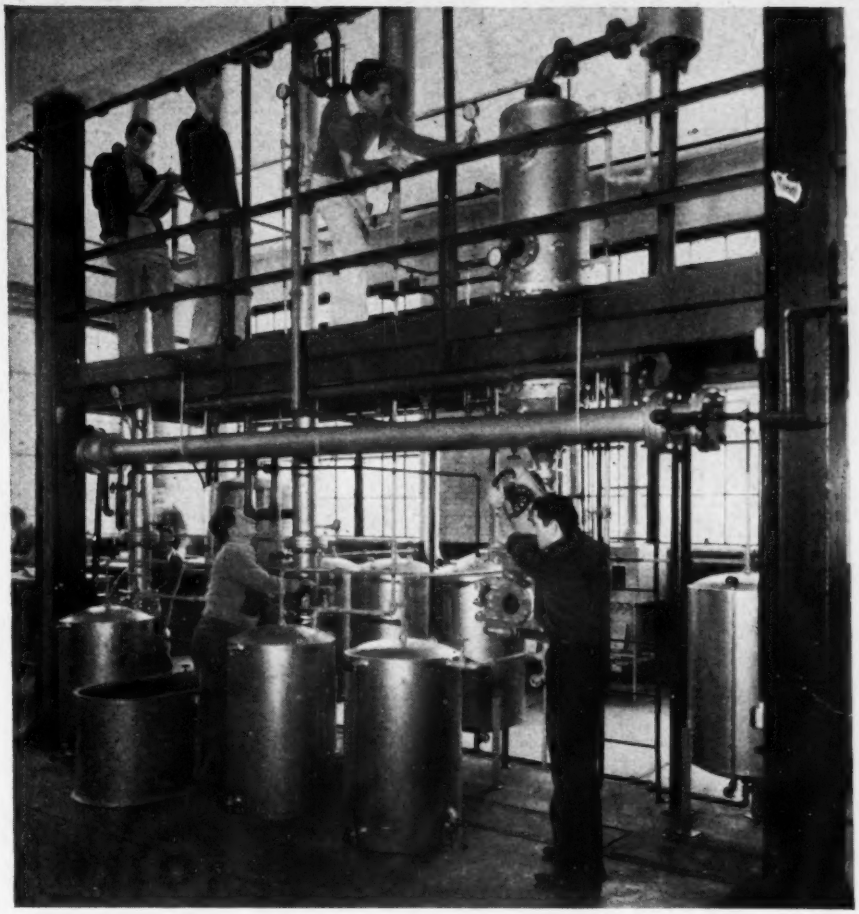
Important to industry are the men who are now studying in graduate schools. The number in chemistry departments planning to earn master's degrees by next June, is twice as large as the group working toward doctorates, and the total number of graduate students destined to receive degrees next June is thirty per cent as large as the number of undergraduates. This seeming increase in graduate work may be explained in part by the fact that some draft boards have been more lenient toward this group than to the undergraduates.

The number of men working toward master's degrees in June, 1946, is the same in chemical engineering as in chemistry. Only one-fifth of the total number of graduate students in chemical engineering are studying for their doctorates. The graduate group is only a third the number of undergraduate engineers. There are over three times as many foreign graduate students who plan to return to their native lands after graduation in chemical engineering as in chemistry. This group, however, is negligible, being less than one per cent of the engineering graduate students.

FELLOWSHIPS

A vital cog in the machinery of a university is the graduate work which is accomplished behind its doors. The men who search here often set the standard for the whole campus. These researchers are in many cases guided in their choice of a school by the financial aid available. CHEMICAL INDUSTRIES, in an attempt to compare the present situation with prewar conditions, discovered by its survey that forty-three per cent of the chemistry departments now have fewer men studying under fellowships than before the war. Thirty-four per cent reported an increase in the number of fellows, while twenty-three per cent stated that the figure was the same. Of the chemical engineering departments, forty-six per cent showed a decrease in the number of fellowship men, with seventeen per cent claiming an increase and thirty-seven per cent remaining unchanged.

In the interpretation of these figures it should be pointed out that, due to the



Even more pressing than the shortage of chemists in industry is the shortage of chemical engineers. Here, in the chemical engineering laboratory of Rose Polytechnic Institute, Terre Haute, Ind., engineering students solve problems involving the use of an evaporator and other equipment.

present draft situation, many competent men are unable to pursue graduate studies, and many educational institutions are offering fellowships which are unfilled.

It is also true that there is money available for fellowships which has not yet been definitely assigned. When the government tax policy regarding industry is defined, more industrial fellowships may result. It seems reasonable to look to industry to share the responsibility of educating the men on whom it will eventually depend for its continued progress.

DISTRIBUTION

Viewing the current status, it has been revealed that sixty-five per cent of chemistry department fellowships are for teaching, compared with thirty-five per cent for research. In chemical engineering only thirty-six per cent of the fellowships carry teaching responsibilities, while sixty-four per cent of the total are concerned with research. This may be explained by the fact that most of the teaching done by fellows is in freshmen and sophomore subjects. Students in both chemistry and engineering departments are required to take these beginning chemistry courses, which are given by the chemistry departments. Another factor is that industry is on the whole more interested in the practical problems which come under the heading of engineering research, and is therefore more apt to sponsor research in that field.

VETERANS

Encouraged by the G. I. bill of rights, veterans are daily returning to classrooms in increasing numbers. In spite of the lure of "big money" in trades not requiring college training, many men now realize the value of education and are turning to it. In the service many saw a correlation between commissions and education. A number of the boys who left their books in 1941 are returning now as serious men with family responsibilities. Instead of crew cuts, gum-soled shoes and beer steins, their future activities will be concentrated on slide rules, blue books and test tubes.

G. I. COUNSELING

To prepare for the orientation of these men, colleges and universities have attempted to visualize all the types of problems which may arise and to make provision for them. Arrangements have been completed so that enrollment, even in the middle of a semester, can be smoothly accomplished. In some universities, such as Yale, Columbia, and the University of California, special bureaus have been established to serve veterans in all departments. Dartmouth, Temple, Lafayette, the University of Wisconsin, and many other schools have appointed special committees for this purpose. Advisors have been designated by N. Y. U., Syracuse, Northeastern, Oberlin and others. The feeling has been expressed by Swarthmore, for example, that individual treatment will be the most beneficial. Case School of Applied Science has mentioned that it will have a staff psychologist working from the dean's office. On the other hand, several schools have stated that veterans will simply be treated as students. The University of Alabama feels that there is no need for special veteran reorientation.

REFRESHERS

The CHEMICAL INDUSTRIES survey asked chemistry and chemical engineering departments whether survey or refresher courses would be offered. The engineers replied almost two to one that they believed some such arrangements would be made. But the chemistry department answers were divided evenly: half plan survey type courses; half do not. Several schools such as Pomona College, University of Arizona, and the University of Denver, will substitute careful planning of curriculums, arranging lighter schedules in some cases, granting special privileges, and tutoring. In some schools survey courses will be available outside of the department, as in the extension courses at Columbia.

This is also true of subjects taught at precollege level. Veterans desiring to complete requirements or strengthen weak spots may enroll in courses which will give them no credit. Some schools are recommending brush-ups in math and physics. About twice as many of the chemical engineering colleges will offer these courses as plan not to do so. In chemistry the division is approximately equal.

Veterans will be allowed to audit courses (without receiving credit), if they are enrolled in the institution in over two-thirds of the chemistry departments, and in three-fifths of the chemical engineering departments.

Heads of both chemistry and chemical engineering departments responded unanimously that veterans are fitting into the regular college curriculum smoothly. A few men upon returning over-estimated their ability—not realizing that technical subjects easily slip away when not in use. "Most veterans appreciate the fact that there is no substitute for sound training in the sciences and engineering subjects and skim-over courses are a waste of time," comments Dr. Hixon, head of the chemical engineering department at Columbia. On the whole veterans seem more serious —and once over the hump of getting back into study habits (harder for some than for others), they are proving themselves as successful in the classrooms as they were in the theatres of war.

(Illustration Courtesy Monsanto Chemical Co.)

Styrene, one of the many important chemicals based on petroleum products, is produced for synthetic rubber at this Texas City plant.

Trends Disclosed by New Chemicals

EVERY YEAR RESEARCH IS RESPONSIBLE for the discovery of new chemical compounds and formulations; and in the course of time process development brings them into the domain of commercial practicability. By scanning and interpreting new advances, it is possible to surmise, at least to some extent, whither our knowledge is leading us.

A STUDY of the new chemicals introduced during the last few years by the industry reveals that research is no longer a haphazard affair which experiments blindly in the hope of turning something up. Properly directed research keeps an eye on the economics involved—what raw materials are in abundance; what more desirable and, consequently, more profitable products can be made from present products which have a smaller or cheaper market; what waste materials can be converted into something useful; and what reaction by-products are of such potential commercial importance that they might become the primary goal of the reaction.

Processes rise and fall with the tides of supply and demand. A synthetic rubber industry of gigantic proportions was conceived, born, and raised to maturity in the space of a few months. Now natural rubber will be coming back, and it is interesting to speculate in what directions our synthetic rubber production capacity will move.

The urgent necessity for undreamed-of destructive power caused the chemistry of plutonium and uranium 235 to take great strides in a few years—work usually requiring half a century. Whether this process will be extended and improved for peacetime use depends upon whether atomic power can compete economically with present sources of energy.

Art continues to improve upon nature in the manufacture of new structural plastics and textile materials. Nature supplies the raw materials, whether it be sand or oil or chicken feathers, and art—always working in accordance with economic law—processes them and fabricates them into material benefits for mankind. It is interesting to note in this connection that rayon, the first synthetic textile, has in no wise been supplanted by the newer materials; nor will it be, so long as it fulfills an economic function.

And so it is that new materials live side by side with the old ones, or in some cases supersede them as the complexity of our art demands specific properties in a material to do a specific job. Always the general trend, the more specific facets of which are discussed below, is first to do something better, and then do it cheaper.

Further along in this issue is a compilation of the products introduced during the past two years by advertisers in CHEMICAL INDUSTRIES. While this compilation does not include all the new materials developed, it does comprise the large majority of them. These descriptions come from all segments within the scope of the chemical industry—from petroleum refiners to manufacturers of chemical specialties—and they represent therefore a cross-section of modern trends.

A study of them will support these general remarks in that these materials have been made cheaply and await finding a use, have been designed to accomplish a new specific purpose, or have been found to fill a present need better than existing materials.

PETROLEUM

MORE AND MORE every year petroleum becomes an increasingly important source of chemical raw materials. Just recently it has been claimed that the petroleum industry is able to supply all the demands for aromatic solvents—a province which until a few years ago was in possession of the coal tar industry. Even during the first World War a small amount of toluene was obtained by extraction of crude oil. Extraction was supplanted by cyclization of heptane, and now tremendous quantities are made by hydroforming of naphthenic hydrocarbons. Xylenes and cumene are also made from crude oil, and there is reason to believe that benzene might be made profitably by partial hydrogenation of the residue from low-temperature carbonization of coal.

New refining processes, of which fluid catalytic cracking is only one example, made it possible to vary the composition of the product within wide limits so that production of various types of chemicals can be adjusted to meet the changing demand picture. Thus butylene for aviation gasoline and butadiene for rubber were made in great quantities during the war. It is probable that now the emphasis will shift to the higher molecular weight Diesel fuels, although the lower hydrocarbons will find ready utilization in synthetic fuels and other chemical compounds.

An increasing number of derivatives are being made by petroleum companies. Among these are aliphatic nitriles, mercaptans, and disulfides, low-cost thiophene, and aliphatic acids. Propionic acid, for

example, is now being produced cheaply from petroleum hydrocarbons, making feasible the production of a competitive cellulose propionate plastic.

Plant location is an important consideration in any discussion of petroleum chemistry. Many chemicals can be produced more cheaply from petroleum at the plant; but since the producing locations are necessarily far removed from the site of consumption, the saving is often lost in transportation charges.

While the petroleum industry in this country has been making more and more chemicals, the chemical industry has at the same time been encroaching upon what was formerly the province of petroleum. The last few years have witnessed great activity in additives for oils and greases—inhibitors, pour point depressants, viscosity index improvers, and the like. One company has introduced completely synthetic, non-petroleum lubricants and hydraulic fluids.

(Illustration Courtesy Western Regional Research Laboratory)

To convert a waste material into something useful was the goal of this project on chicken feathers. A textile, using feathers as a raw material, was recently successfully produced.

RUBBER AND PLASTICS

ONE CANNOT think of the petroleum industry without thinking of synthetic rubber and plastics. Our synthetic rubber industry was built largely on petroleum, and it would have been more so except that butylene had to be diverted from butadiene synthesis to aviation gas manufacture. The end of the war has left us with facilities to produce great quantities of butadiene and styrene, and it is probable that an extensive plastics industry will be built around these materials.

Much work has been done in extending the applicability of the older plastics, such as the acryloid types, the urea- and melamine-formaldehyde types, and the alkyd resins. Polymerizable aqueous solutions of melamine resins have been adapted to the shrink-proofing of wool, and the urea type has been used to increase the wet strength of paper and the hardness of wood. Aqueous resin dispersions have been developed as adhesives and protective coatings, and pentaerythritol resins, used extensively during the war, are becoming increasingly important as a variant of the alkyd type. Nylon now takes new forms, having been introduced recently as a molding powder.

PLASTICIZERS

Since a plastic is no better than its plasticizer, many of the new compounds introduced have been developed for admixture with polymers to give formulations with desirable properties. These plasticizers are of all types of chemical compounds: chlorinated biphenyls and terphenyls; esters of high molecular weight acids; organic phosphates; esters of high molecular weight alcohols or glycols with lower acids, such as carbonic acid; sulfonamides; alkenyl succinic anhydrides; substituted phenols; and N, N′ dialkyl amides.

A new type of plastic materials is based upon organic silicon compounds (*see* CHEMICAL INDUSTRIES, October, 1945, p. 638). The silicones range from high-boiling liquids to thermosetting plastic solids whose principal uses at present depend upon their unique resistance to decomposition at high temperatures. The electrical properties of silicones and their inertness towards chemical attack open up many new uses for liquids, rubbers, plastics, and greases composed of or compounded of these materials.

Halogen compounds are being used more and more in plastics, both as polymers and as modifying agents. Chlorinated biphenyls and terphenyls have already been mentioned as plasticizers. Tetrachlorophthalic anhydride, chlorinated rubbers, and improved chloroprenes have been introduced, and it is expected that some fluorine-containing plastics, such as tetrafluorethylene, will soon become commercially important.

Two other new plastics, polyethylene and cellulose propionate, are potentially important economically as well as technically.

A growing tendency in plastics seems to be the use of two or more copolymers. Butadiene-styrene, methyl-ethyl acrylate, and vinyl-vinylidene chloride are examples, and in the future we can expect to see more plastics combining the specific advantages of each of a number of constituent polymers.

PHARMACEUTICALS

THE BIGGEST news in pharmaceuticals in recent years is, of course, penicillin. The wide publicity given to its amazing abilities, true though it is, has tended to overshadow other important discoveries. One of these is streptomycin, which is more effective than penicillin in the control of Gram negative bacteria. At least two plants for large-scale production are planned for the near future.

Great interest attaches itself at present to pure amino acids and protein hydrolysates. The former have now been made available in quantities sufficient to study their metabolism; and the latter which are recently introduced mixtures of amino acids obtained by hydrolysis of casein and other natural proteins, are finding use in combating acute malnutrition in war-devastated areas.

There is nothing particularly new in vitamins, although a few new mixtures have been introduced for foodstuff enrichment. Interest still continues high in estrogens and androgens, and a cheaper, less pure estrogenic substance has been offered.

A number of new germicides of various types have been developed: active chlorine compounds, such as chloramine-B; quaternary ammonium halides; and chlorinated phenols rather similar in structure to DDT. In addition, a number of intermediates have been made commercially available in recent months.

CHEMOTHERAPY

It is probable that chemotherapy—combating diseases and deficiencies with specific chemical agents—is on the threshold of even further expansion (*see* CHEMICAL INDUSTRIES, April, 1945, p. 584) than in the past. Even the end of the Pacific war will not halt the search for new and better synthetic antimalarials. Elucidation of the structure of penicillin will point new directions for research, just as the discovery of sulfanilamide as the active principle in

Prontosil opened up the field of sulfa drugs. The recent synthesis of quinine was a brilliant academic achievement—but hardly more than that. Far more important is the correlation of chemical structure with physiological activity, delineating the path down which the researcher must travel to discover new and more effective therapeutic agents.

INSECTICIDES AND FUNGICIDES

HAVING BEEN used by the armed forces since 1942, DDT can hardly be called new. It is new, however, in the sense that it has now been made commercially available by a number of companies who were previously making it exclusively for military use. Not only is DDT offered to the trade, but also a number of solvents, extending agents, and formulations.

Other new insecticides and fungicides are also offered: copper compounds; organic sulfur compounds, such as dithiocarbamates, and thioacetamide; quaternary ammonium salts; and aromatic chlorine and fluorine compounds.

A great deal of the research now being done in this field is being carried out in a manner akin to therapeutic research; i. e., the activity of several related compounds is studied in an effort to correlate activity with structure. It is probable that new compounds, similar to DDT but more specifically effective against certain pests, will be offered within a short time.

AGRICULTURAL MARKET

A word might be said here about the increased application of chemicals in agriculture. Insecticides and fertilizers have long been used, but recent years have seen a growing interest in other specialized agricultural chemicals. Among these are herbicides, used in weed control; plant hormones, which prevent premature dropping of fruit; defoliants, to remove leaves and thereby aid harvesting; and fungicides, to control apple scab and other fungus growth and to keep seeds from mildew and rot.

There is also a large potential market for pharmaceuticals for use in treating farm animals. One company has developed a form of penicillin especially designed for veterinary use, and serums, vaccines, vitamins, and sulfa drugs are also expected to find profitable utilization. Such diverse agricultural products as capons and tomatoes are improved, it is claimed, by administration of sex hormones. It is probable that a host of new chemical products will be developed in the near future to raise both the quality and quantity of farm products.

OTHER ORGANICS

SEVERAL new organic compounds are offered for the first time, and many old ones, known before in the laboratory, have now assumed commercial proportions at commercial prices. Among the latter are chloral; various chloroacetic and chloroformic esters; furan and tetrahydrofuran; and trioxane (formaldehyde trimer). The coal tar industry has put out several alkyl pyridines and quinolines, isoquinolines, xylenols, and pyrene. Other new chemicals are aromatic fluorine compounds, aliphatic amines and diamines, aryl phenols, and organic peroxides.

Many of the new compounds have particularly interesting possibilities since they contain more than one functional group. Such compounds are itaconic acid, mercaptoehanol, acetylacetone, various nitrothiophenes, vinylpyridine and ethanolpyridine, sulfobenzoic acid, phloroglucinolcarboxylic acid, allyl chloroformate, and various di- and polyamines.

The number of polyfunctional compounds recently introduced suggests that new plastic materials might be developed at an increasing rate. In order to form a polymer a compound must contain two or more reactive centers.

INORGANIC

THREE INORGANIC reagents now commercially available are nitrosyl chloride, 90% hydrogen peroxide, and sodium hydride. They are mentioned together, for they should prove interesting for use in the important processes of chlorination, oxidation, and hydrogenation, respectively.

Many new phosphates have been introduced which should find use in the manufacture of improved glasses; among these are boron phosphate, aluminum pyrophosphate and silicophosphate, and strontium, barium, calcium, zinc, and lead phosphates. The ammonia-like compound, hydrazine, has also been introduced to the market.

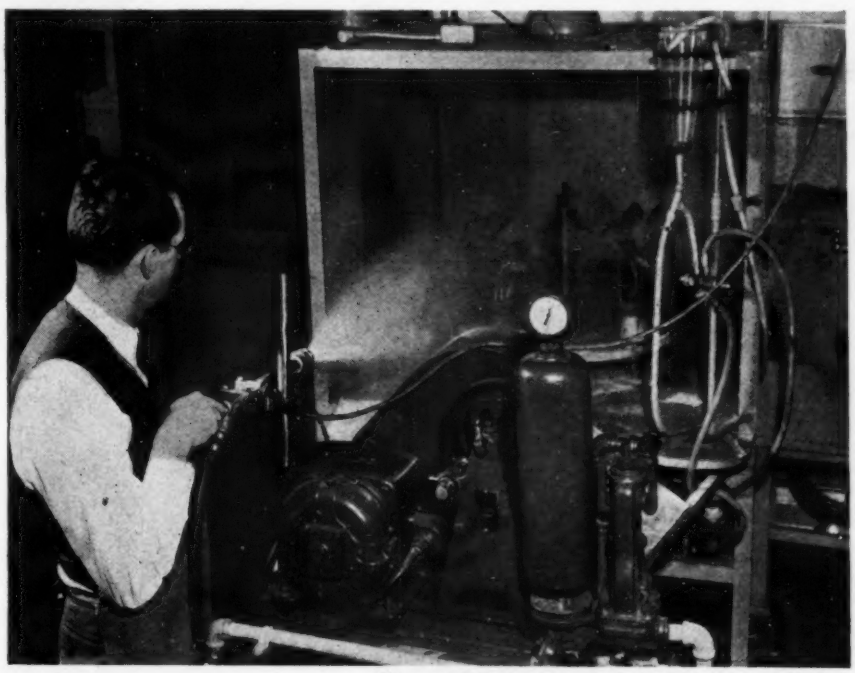
SPECIALTIES

MANY of the new products are adapted, either by physical form or by formulation with other materials, to meet a specific need. That, indeed, is the only demarcation possible to make between chemicals, as such, and specialties.

Many of the resin dispersions are made in that form to facilitate their use as adhesives and coatings. One of the new ones, for example, is especially designed to laminate metal foil to paper, and another is made to render paper greaseproof.

The textile field continues to account for a large proportion of the specialties. Among the products offered are glycerol and glycol mono-esters for use as softening and dispersing agents; shrinkproofing resins and a colloidal silica dispersion for slip-proofing and delustering; fungicides to prevent mildew and rot of fabrics in damp climates; leveling agents for dyes; and fireproofing agents.

Also used in textiles but having a wider field of application is the host of new synthetic detergents. One type of this group are the hydrocarbon sulfonates, a class of compounds which are destined to play an ever-increasing role by virtue of their economy. Lack of natural fats and oils led Germany to use synthetic detergents almost exclusively during the war as a replacement of soap. In this country the synthetics are becoming increasingly important in specific applications, although the time is still far off when soap will be supplanted as a general cleansing agent.



(Illustration Courtesy E. I. du Pont de Nemours & Co.)

Hundreds of chemical compounds are potentially useful insecticides or fungicides. In order to evaluate these products of research, they are tried out under carefully controlled conditions.

(Illustration Courtesy Woburn Chemical Co.)

The steel drum is the most widely used container in the chemical industry. Those in foreground are being checked for shipment while new ones are stacked in the rear.

Postwar Packaging for Chemicals

MANY CHANGES IN PACKAGING MATERIALS and techniques came about as a result of the war. Many of these were "doing the best we could with what little we had," and a return to prewar standards is eagerly awaited; but many changes were in a forward direction, and all who package, handle, or use chemicals will profit from the lessons learned.

SHALL we package in fibre or steel drums? Would cotton bags serve us better than multiwall paper? Would a protective lining keep our product from becoming contaminated? These questions and scores of similar ones are being asked by shippers, now that they again have a choice of materials to ask questions about.

The problems of packaging, as a rule, do not lend themselves to any permanent solution; each new product—each new destination or means of transportation, in fact—raises them anew. The war created such problems when large quantities of vital materiel had to be shipped under the most hazardous and difficult conditions and yet be kept safe from the harm of moisture and corrosion. At the same time many of the usual packaging materials were virtually unobtainable, and satisfactory substitutes had to be developed. Techniques, too, had to be improved in order that shippers might meet the unprecedented demands—in speed as well as in quantity—for materials to feed the machinery of war.

Not all of the substitutes have been satisfactory. During 1944, $60,000,000 were paid out in loss and damage claims arising from inadequate packaging—a sum 36 per cent higher than that paid out in the preceding year. Some of the increase may be attributed to the rush and large scale of shipping, but a large share of it was undoubtedly due to failure of makeshift solutions to packaging problems. Thus, the need is apparent for careful packaging, so that goods may reach their destination in good condition. So necessary are adequate packing and shipping to our industrial economy that our wits and resourcefulness are challenged to reduce this tremendous loss.

As soon as all materials are again freely available—and that shouldn't be long—it behooves all chemical manufacturers to choose carefully among all the alternative solutions to their packaging problems in an effort to find the best. In so doing, the primary consideration, of course, is to find a package which does a good—or more than good—job. Packaging should be over-designed if it is to be properly designed. An important but nevertheless secondary consideration is economy, and under this head the shipper must consider the original cost of the package, cost of handling in the plant, freight cost, and the ease and economy of handling by the customer.

In order to help answer these questions, we have interviewed some of the leading manufacturers of the various types of packages and packaging materials. We have learned how these manufacturers have overcome some of the disadvantages of their particular type of package and, in general, how these packages have been improved over their prewar predecessors.

STEEL DRUMS

MORE WIDELY used than any other container in the chemical industry is the steel drum. The quality, if not the quantity, of these containers was maintained throughout the war; the grade of steel was not reduced, although at times, because of congestion in the steel mills, it was necessary to eliminate some of the finishing methods. The opinion was expressed that the quality of sheet steel available from now on will be improved beyond the quality obtained before the war.

Although new processes for treating steel, such as "coronizing," have been developed to retard corrosion and its accompanying contamination, it is apparently not the intention of manufacturers to incorporate these changes at present. They will continue to stress, as they have in the past few years, the coating of drums with lacquer and synthetic resins. There has been some activity, too, toward cutting down the number and standardizing the various types of linings.

It is very likely, according to those in the industry, that sheet steel prices, and consequently the cost of drums, will be forced higher. In spite of that fact, the opinion appears to be unanimous, both on the part of manufacturers and of users, that the bulk of all drums produced will be, as before, the single-trip type. The heavy returnable type will be reserved for those products which are highly inflammable or corrosive and require heavy drums, the investment in which is so high that they must be of the returnable type.

It would appear at first glance that large economies could be effected by reusing drums. This is a fatuous belief, however, in view of the labor involved in preparing it for reuse. Unless the drum is of very heavy construction, it is usually dented considerably from handling; and almost invariably the drum has to be cleaned and dried even if it is to be used for the same product. The bookkeeping involved in keeping track of drums is also a substantial factor as well as rehandling and reloading. Smaller custom-

ers, too, object to the deposit required on the expensive, returnable drums.

Users of steel drums cite a number of advantages: They are strong; they are moisture proof and fireproof; they can take a lot of rough treatment; and many customers prefer them because they are equipped to handle them. Against them they cite their weight, which increases freight expense; their susceptibility to rust and corrosion; and their higher initial expense.

For the shipment of certain solid products, such as hard resins, economies can be effected by fabricating steel or plywood drums right in the plant. Thus the flat material cut to size can be freighted and stored in a very small space and the drums manufactured as needed.

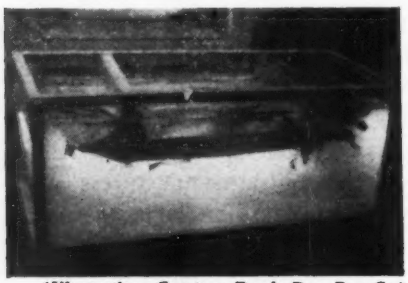
Based on information from Atlas Steel Barrel Division, Rheem Manufacturing Co.; Niles Steel Product Division, Republic Steel Corp.; and Steel Shipping Container Division, Wheeling Corrugating Co.

MULTIWALL BAGS

PAPER is the cheapest starting material for container manufacture, and consequently, the original cost of the finished products is the lowest. Paper is not in itself, however, a strong structural material, and much interest therefore attaches to the various ways in which it can be treated. There is a great deal of flexibility in the starting material, in that paper can be made uniform in many grades, weights, widths, and types. It lends itself readily to impregnation, lamination, and coating. Through these treatments papers are being made which offer various degrees of resistance to gas, heat, fire, acids, alkalis, oils and greases, sunlight, insect infestation, mildew, moisture, and other hazards.

Resistance to these hazards as well as wet strength are imparted to the paper by the use of new impregnating resins of the urea-formaldehyde or melamine-formaldehyde types. Further resistance to moisture is conferred upon the bag by asphalt lamination or resin coating. A relatively unexplored field is the use of metal foil barriers in multiwall bags, a development which might well expand in the future. In addition to impregnation, lamination, or coating, additional safety is obtained by the use of sealing compounds for closures, acid resistant thread, and waterproof adhesives.

Paper is more vulnerable than rigid materials, of course, to snagging, breaking, and other hazards of rough treatment. The only satisfactory way to avoid these troubles is to educate users in proper handling. Insistence on high standards of paper quality (Federal Standard Stock Catalog Specification UU-S-48, for example) will do much to alleviate the loss due to these causes.



(Illustrations Courtesy Bemis Bro. Bag Co.)

A multiwall bag undergoes an immersion test.

CLOSURES

Closures have been improved during the war in regard to both effectiveness and economy. The accompanying illustration shows an immersion test of a filled bag in water. No leakage was observed after 24 hours' immersion. Originally made from starched crinoline laminated to double napped flannel, this closure will soon be offered in a more economical all-paper form.

The standard closures are the sewn valve, pasted valve, open mouth, and sewn open corner. Various types of filling machines and automatic or semi-automatic sewing machines are available for carrying out the filling and closing operations.

The Multiwall bag is available in various sizes, but war-time experience indicates a trend to a maximum of 100 lbs. It is expected that bulk packages will range between 50 and 100 lbs., and the tendency is to standardize the packages in decimal units.

In addition to selling bags, companies offer engineering services to users, including recommendations for conveying, filling, loading, stacking, handling, shipping, palletizing, and the like. One company has recently organized a Packaging Service Division to augment current services; another emphasizes and advises upon proper storage and humidity control.

Multiwall bags were used last year to package more than 300 different commodities, including such hygroscopic materials as ammonium nitrate and calcium chloride. Their chief advantages over competitive containers are economy of original package, light weight, and ease of storage of empty bags.

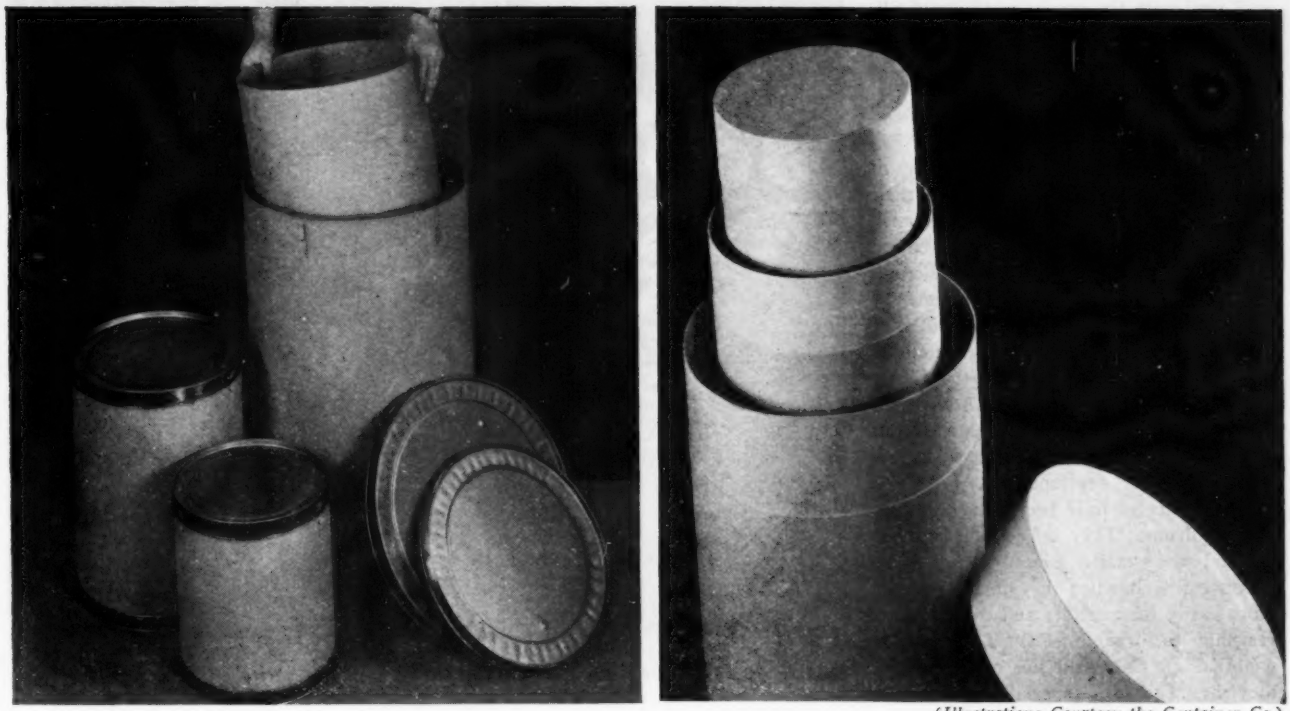
Based on information from St. Regis Paper Co., Bemis Bro. Bag Co., and Chase Bag Co.

CLOTH AND PAPER-CLOTH BAGS

COMPETITIVE with the paper bag is the cloth bag. Although the initial cost is greater, it has the distinct advantage of reusability. This factor is more important for products like cement, flour, or sugar which are sold to the ultimate consumer, but even for chemicals the reuse factor is one which deserves consideration.

The combination paper-cloth bag is not in competition with the paper bag, one manufacturer states, so much as it is with the steel drum. The initial cost is about

The multiwall bag has found wide application in the chemical industry. The cloth bag, too, is used for some purposes.



(Illustrations Courtesy the Container Co.)

Fibre drums of various sizes are made with several types of closures. The empty drums can be nested for economical shipping.

twice that of paper, but it has found application for the packaging of hygroscopic chemicals, expensive industrial chemicals, and compounds containing water of hydration. The high cost is offset somewhat by the fact that the cloth-paper bag is not so easily snagged.

Based on information from **Bemis Bro. Bag Co.** and **Chase Bag Co.**

FIBRE DRUMS

THE WARTIME shortage of steel forced a lot of materials into fibre that hadn't been there before. Manufacturers have seized upon and exploited the inherent advantages of fibre, such as its economy and lightness. Much has been done, too, to minimize its disadvantages, such as less strength and less resistance to chemical action, moisture, and the like.

The development of new synthetic resins has broadened the use of fibre drums. Used as interior coatings, they render the drums more resistant to chemical action, greaseproof, moisture vapor proof, and proof against product contamination. Used on the exterior of the drum, resin increases the attractiveness as well as scuff and weather resistance. This has been brought about, not only by the development of more versatile resins, but also by faster conversion and cure as well as improved techniques employing water solutions and emulsions. Research is being done which will lead to cheaper and more efficient coatings. Porosity and contamination have been decreased by the use of metallic foils and flexible, transparent plastic films of the vinyl type. Among those which have found wide use are Polythene, Saran, Vinylite, and Koroseal. Special hard-finish paper stocks have also been developed to reduce porosity.

Strength of the drums has been increased by use of better, more waterproof adhesives. An extra handicap of the war was the fact that paper stock was inferior, even to prewar standards. Return to normal operations by the paper mills will make possible the purchase of better quality paper. Manufacturing techniques have also been improved, one manufacturer using a 200-ton hydraulic press. The drums are convolutely wound into a one piece shell and turned inwardly top and bottom without cutting or scoring. The turned-over ends of the shell are formed into a series of pleats which, with properly treated heavy discs, are pressed into solid seamless ends. Many are made without metal.

CLOSURES

A number of different types of closures are offered in fibre drums, each one designed for the use of a different type of product. The usual type is an open head with a slip-on fibre cover meeting flush with the upper edge of the outer shell of the drum and sealed to the shell with adhesive paper tape. Another type offered is an open-head wood closure recessed and held in place by an L-shaped iron rim. All-metal closures are also offered, the open-head type held in place by a curled edge with lugs, or a lever-type or bolted metal locking bands. These are often used with a crepe sealing disc to prevent contact of the product with metal where incompatibility exists. Other special types are a combination wood-fibre closure; metal ends with friction or bolted plug closures for liquids; and cone type metal tops.

Sizes of fibre drums, like steel drums, are rated in gallons. They are available from ¾ gallon to 75 gallons. The standard sizes permit nesting to save space in shipping empties, and even the same size is obtainable in different diameters to offer the same convenience. No particular sizes are recommended by the manufacturers since the unit package depends to a great extent on the type of product. The larger sizes can be handled conveniently by a two-wheel truck, much as a steel drum.

Foil lines a container for pharmaceuticals.

Filling of the drums, like their handling, is accomplished in the majority of cases, by the same machinery used for steel drums. Some individual users have developed ways of handling their own particular problems such as eliminating dust during the filling as well as devising methods to prevent packing down of the material in transit.

The manufacturers are equipped to offer recommendations on use of the drums. In many instances they have given advice or helped design equipment for more efficient methods of filling, conveying, and closing. A manual now being prepared

will deal with the proper methods of filling, loading, handling, shipping, and storing of fibre drums.

COST AND COMPARISON

Manufacturers agree that the new improvements will not add to the cost of fibre drums. Resin coatings and their application are being made at lower cost, and other improvements are inherent in new and better methods of manufacture. When specially constructed drums of more expensive design are required, they will normally replace prewar containers of a more costly type. What the future holds in the way of increased material and labor costs has yet to be learned, but there will be no price increase due to actual container developments.

Disadvantages have been cited by users of fibre drums: They are scorched by hot liquids; the smaller sizes do not have a convenient handle; they tend to break more easily than metal; and they are not resistant to organic solvents, especially naphtha. On the credit side of the ledger, they are cheaper, especially for caked material where the container has to be destroyed to recover the contents; they present no rust or corrosion problem; and they can be custom-built, more or less, to fit the particular needs of a certain product.

Based on information from the Container Co. and Emery-Carpenter Container Co.

FIBRE BOXES

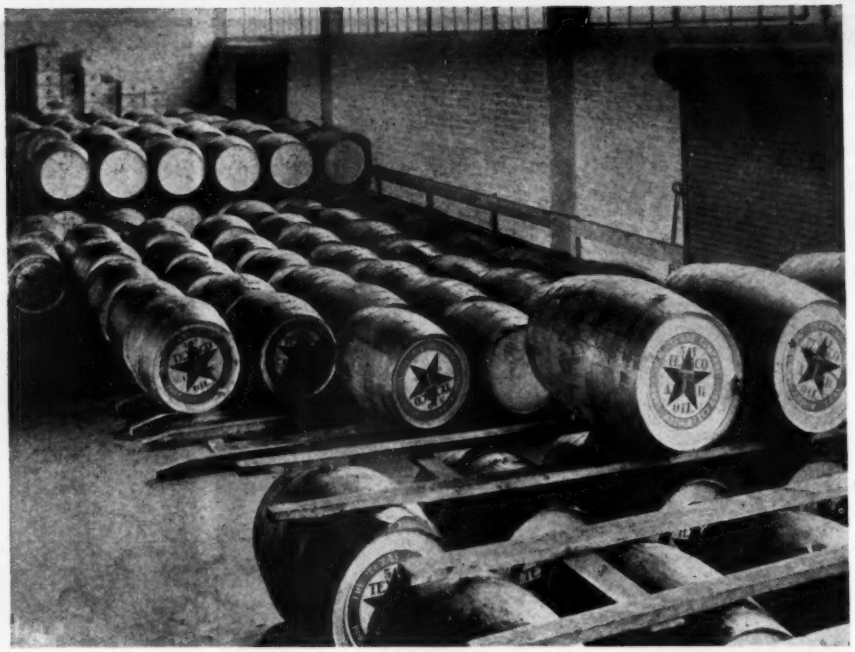
WARTIME developments for military shipping are the V and W boxes. These fibre boxes are extremely resistant to weathering. Perhaps the use of these very expensive and specialized containers will be fairly limited, but they will find use in packaging for special conditions—export, for example.

The war accelerated the development of these superior fibre boxes. The techniques involved in their manufacture are still somewhat difficult and expensive; but at least the industry has learned how to do them, and the probability is that they will learn how to do them more and more economically under normal competitive conditions.

It is difficult at present to evaluate their usefulness in postwar packaging, but whenever there is a situation with which fibre containers could not formerly cope because of their lack of resistance to water and weather, the situation should be reexamined to see whether these new methods might not be unexpectedly useful.

In addition to these special boxes, ordinary corrugated and solid fibre boxes have been increasing in popularity during the last few years. They have been replacing the wooden box for many items, especially on account of their light weight. All of the manufacturers contacted expect to make further improvements when the pent-up demand for the present types is satisfied and when a sufficient labor force is obtainable.

Based on information from the Hinde & Dauch Paper Co., Container Corp. of America, Robert Gair Co., Inc., and Gaylord Container Corp.



Both tight and slack wooden barrels are used for chemicals. Here oil is packed in barrels.

METAL FOIL

THE USE of metal foil in combination with paper and fibre was mentioned above, but it is a development of sufficient importance to warrant a more detailed account.

The postwar use of aluminum foil will afford a method of moisture vapor control not offered by other flexible materials. Aluminum foil coated or laminated to thermosealing materials will be used for unit packages of pharmaceutical preparations. Applied as a spiral or convolute winding to fibre-bodied cannisters or used as an impervious drum head beneath the friction plug in such containers, the foil will provide protection comparable to a metal-bodied cannister. Case or drum liners fabricated from coated or laminated foil barriers will be used for shipment of hygroscopic drugs and chemicals. For bulk shipment of these products lamination of foil to corrugated or solid fibreboard may be used. For maximum protection these containers should be sealed with recently developed foil pressure sensitive tape. This new tape is characterized by the lowest possible transmission of moisture vapor when used for sealing slip cover cannisters containing chemicals, film, etc. Set-up boxes covered with foil have been used successfully to ship empty gelatin capsules, which are very sensitive to moisture.

It is interesting to note that every item carried by a soldier in combat upon which he must rely for medical treatment in case of injury is protected by foil-laminated materials.

Based on information from Reynolds Metal Co., Inc.

WOODEN BARRELS

"IT WAS about 25 years ago," a spokesman for the barrel industry has written, "that some 'packaging experts' first predicted that the wooden barrel was on its way out of the chemical industry. Needless to say, wooden barrels are still in constant and substantial use . . . in that industry."

Although the wooden barrel has had to meet the competition of the bag, the drum, and the box, the former fills a demand for a bulk container that is not satisfactorily filled by the others. As a result, while the barrel has lost out to the others for some chemicals, it is equally true that some new chemicals are packaged in wooden barrels.

Ease of handling is one of its advantages. The barrel, even when full, can be handled by one man by virtue of its bulge in the middle which provides a small contact point with the floor and allows it to be rolled and guided easily. Its double arch construction provides unusual strength and makes tiering unnecessary for storage. It stands up well under rough handling, and it is moistureproof, rodent proof, and temperature resistant.

Based on information from the Associated Cooperage Industries of America, Inc.

ALLOYS

IN ADDITION to the aluminum and nickel alloy drums which have been used for several years for the packaging

of special chemicals, many drums, and even tank cars, are now being manufactured from stainless steel. The stainless steel drum costs from five to ten times as much as the ordinary steel drum and is, of course, the returnable type. Its cost is justified where other materials are not suitable for corrosive chemicals, such as acetic acid and anhydride, nitric acid, phosphoric acid, and formic acid. They also find application for the shipment of heavy chemicals to industries, such as the rayon industry, which require extreme purity and freedom from contamination. They are also used for hypochlorites and other "positive" chlorine compounds and for pure liquids in general.

Aluminum drums are available in the standard 55-gallon size. Combining light weight, strength, and freedom from contamination, they will most likely find application in the shipment of gasoline, oils, turpentine, and other organic chemicals. They cannot be used, obviously, for shipping caustic solutions.

Based on information from the International Nickel Co., Inc., the Aluminum Company of America, and Electro-Metallurgical Co.

TANK CARS

A FAIRLY recent development is the lining of tank cars with baked protective coatings to render them resistant to sulphuric, acetic, and lactic acids, rubber latex, ethylene dibromide, and other corrosive materials. A newer development is a coating which is completely resistant to any concentration of hot caustic alkali.

Both types of linings can be repaired easily and simply, when necessary, by the use of an infra-red lamp or other localized heat.

One advantage of the acid-resistant lining is its smooth, glass-like surface which facilitates cleaning. Cars lined in this manner find use in the shipment of latex and other materials which tend to adhere to dull surfaces.

Both linings withstand thermal shock and high temperatures, enabling viscous materials to be heated before discharging.

They are also being used to line steel drums.

Based on information from Heresite & Chemical Co.

PLASTICS

FOR THE shipment of aqueous hydrofluoric acid, a polystyrene bottle has been developed to replace the less satisfactory wax bottles.

Other transparent plastics, Lucite, for example, are used in consumer packaging of pharmaceutical preparations and the like. But it is the opinion of one industrial designer that structural plastics will have no influence on bulk packages. They are too expensive to compete with other materials except in special cases, such as aqueous HF.

PALLETIZATION

BOTH THE Army Quartermaster Corps and the Navy extended greatly the use of palletized loads for shipment.

The practice consists of gluing or strapping, or binding together in some fashion, a number of unit packages on a wooden platform. The entire assemblage can then be handled as one unit for loading into ships, box cars, or trucks. Not only is time saved in handling, but the strength of the assemblage is greater than that of a single unit.

Savings all along the line accrue, according to its proponents—easier handling of packaged units from the production line to the warehouse, better utilization of warehouse and stockroom facilities, less handling in packing, greater speed in moving packages through the shipping room, more economic utilization of trucks and freight cars, and repetition of most of these advantages in handling by the receiver.

It is the opinion of some that an effort should be made to standardize shipping as much as possible by the use of 4' x 4' pallets, giving a unit load of 4 cubic feet. Waste space in transportation media and damage in transit would be greatly reduced.

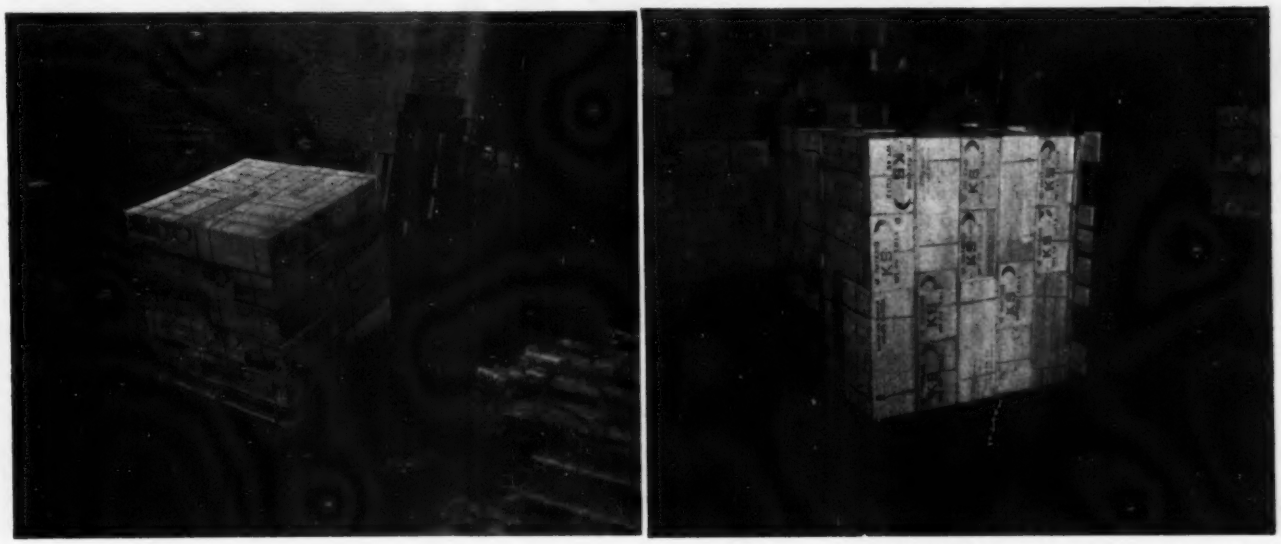
GENERAL

THE TENDENCY is growing to regard packaging as a unified coherent operation rather than a series of isolated and independent steps. More and more attention is being paid to the engineering of packaging procedures from the production line to the customer's plant.

Investment in packaging facilities is often as high as four per cent of total plant investment, and consequently the efficiency and economy with which the operations can be carried out can have a considerable influence on profits.

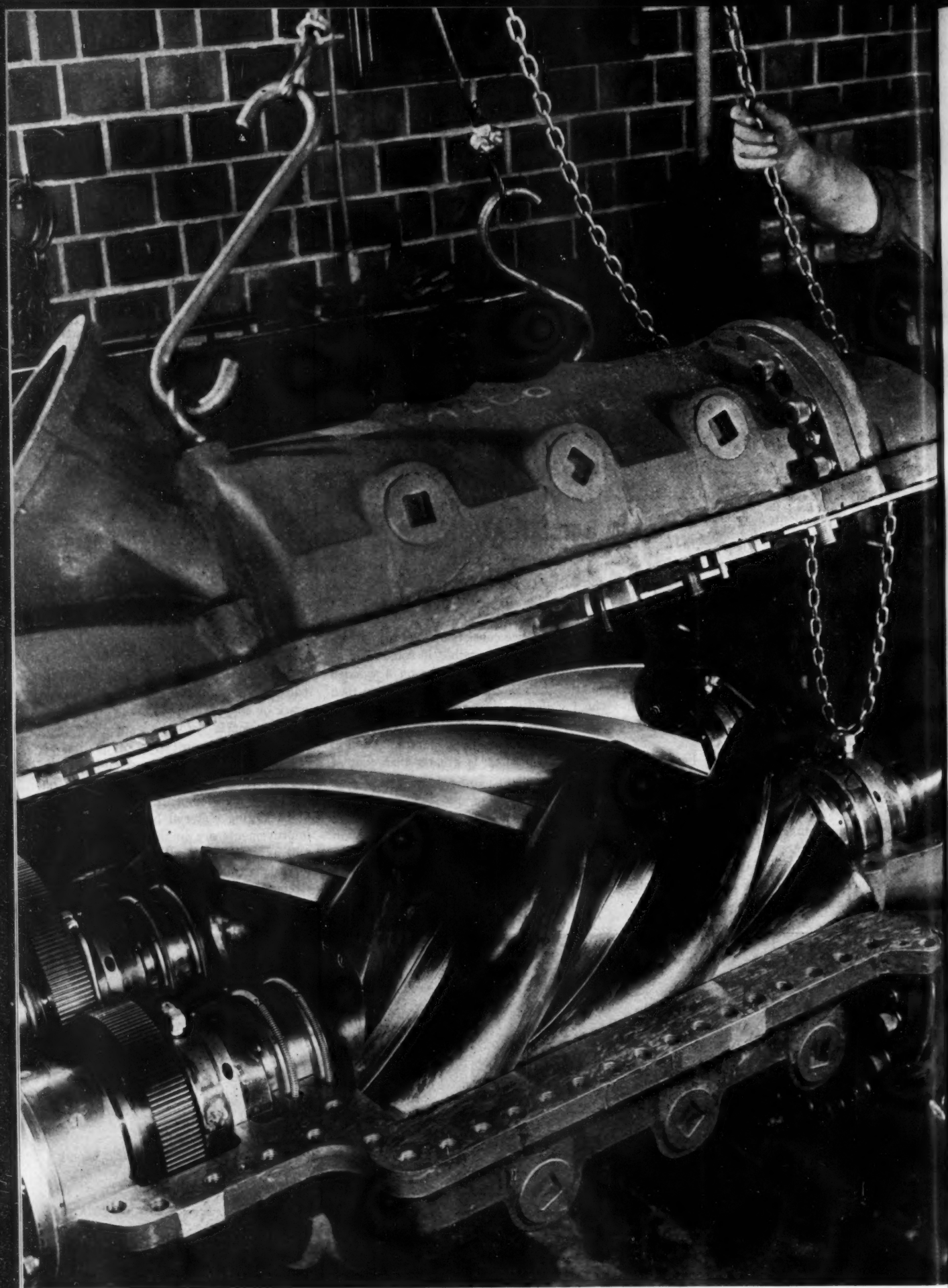
More attention is being paid, too, to the attractiveness of packages—even for bulk shipments of manufacturers' raw materials. Postwar competition will bring prices to comparable levels and quality to a uniformly high standard. In such a case, a customer is likely to buy the best looking material—and a good looking package, particularly if it bears a trade mark or color scheme or some other identifying mark of the supplier, will strengthen the impression of quality.

Radical departures in packaging techniques will have to wait, of course, on machinery developments. A manufacturer of packaging material has remarked that improvements are in the offing, but they will have to wait until depleted engineering departments are restored to full strength.



(Official U. S. Navy Photos—BuS and A—NSOTC)

A glued unit load undergoes a drop test. In the photo at the right the load has undergone three drop tests and a tip-over test.



The new Lysholm type rotary compressor of the Elliott Co.

Process Equipment Developments

TRENDS IN PROCESS EQUIPMENT applications and the basic factors underlying these trends indicate the shape of things to come and point the way to the realization of future potentialities. An understanding of current trends and a knowledge of specific developments are essential tools for the achievement of more efficient chemical production.

WAR necessity created many new process industry plants embodying a host of outstanding engineering achievements in process equipment and plant design. Among these were the government sponsored synthetic rubber, high octane aviation gasoline and high explosives plants. The need for rapid design and construction of these new units resulted in many ingenious adaptations of older operations to new problems. Where adaptation was out new techniques were devised.

Close cooperation between research, development, design, and production groups resulted in the creation of remarkably well integrated and efficient plants. The continuation of development simultaneously with production brought designs to a new level of functional simplicity. And the urgency of the work forced designers to gamble on soundly conceived, but unproved, features which would take years to develop under normal conditions.

While the government-sponsored production programs occupied the limelight, the basic chemical industry under private ownership was forced to expand to meet inflated war time demands for practically all its products, and to create new facilities for special products of war importance. Here industry, working under the handicaps of manpower and materials shortages, made many shifts and changes to break bottlenecks and expand plants. Substitutes accepted in lieu of critically scarce materials have won a permanent place on the team. Mechanization to combat the scarcity of labor has proved its varied tangible and intangible assets.

CHEMICAL INDUSTRIES has undertaken the job of giving its readers a comprehensive picture of the implications of these equipment advances by reviewing the significant overall trends in equipment design and by highlighting the new developments in each of the specific unit operations.

SELDOM is progress as revolutionary as it was with the advent of atomic power. Usually it is more difficult to discern because it comes subtly as a result of evolutionary processes. Many small advances and minor improvements, seemingly unimportant in themselves, combine to significant proportions over even short periods of time. During the past two years the development of chemical plant equipment appears to have undergone both revolutionary and evolutionary advances.

Since the process and equipment detail on the atomic bomb project have not yet been divulged, suffice it to say official releases to date indicate that many outstanding equipment developments have been a part of this immense program. Among those that have been mentioned are new types of pumps, radically new pumps seals, new technique for handling highly corrosive materials, new techniques for fractionating vapors, radically new heat exchangers, and new devices for measuring and controlling processes.

The normal evolutionary advances in equipment designs and applications become evident upon the review of current trends in process applications and upon an examination of the problems confronting the design engineer, where minor improvements take on a new significance.

TRENDS IN EQUIPMENT APPLICATIONS

During the past two years three important trends have appeared in the plant applications of chemical processing equipment: (1) There has been a growing realization that many of the older types of equipment and operations have much broader general application. (2) The use of equipment types which combine two or more operations in one processing step has increased. (3) The general trend toward continuous processing, larger equipment units, and more economical operation has continued at a rapid pace.

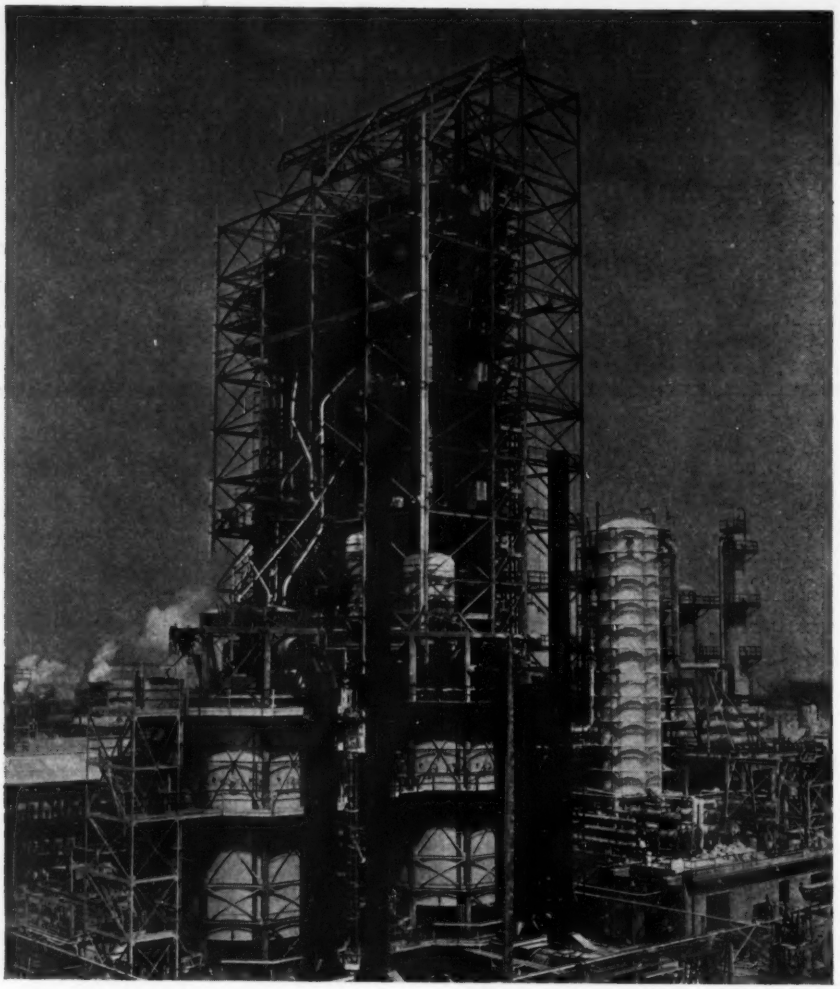
GENERALIZED CONCEPTIONS OF OLDER OPERATIONS

As many older processes of a more or less specialized nature are studied and improved, the basic principles governing their operation are defined. Gradually there develops a realization that these basic phenomena have much broader general applications. Thus operations once considered as water softening and as solvent recovery have been recognized as general adsorption operations. This growing cognizance of the fundamental nature of adsorption has resulted in an increasing tendency to employ adsorption as a unit operation for separating a molecular or ionic constituent from many process fluids.

In the same vein the venerable cyclone dust collector has moved up from the category of an appendage for recovering a dust loss or mitigating a nuisance, to the status of a unit operation step in the heart of the fluid-catalyst system.

In the field of sedimentation this trend toward broader utilization of old principles is exemplified by diversified applications of preflocculation devices to condition thickener feeds; and by new uses of the "sludge-blanket" type clarifier long employed as part of the lime-softening process for hard waters.

This growing tendency to generalize the functions of many operations is contin-



Huge catalytic cracking units for high octane gasoline typify the current trends toward continuous processing, simplification by combining of operations, and the adaptation of older techniques to new service. The above unit is located at the Richfield refinery near Los Angeles.

ually providing new tools for chemical processing.

COMBINED OPERATIONS

A second trend of importance is the increasing use of equipment types which accomplish two or more things simultaneously. Outstanding in this class is the growing use of spray dryers which produce dry powdered materials from a liquid or slurry feed, thus combining such operations as evaporation, filtration, drying and sometimes grinding and classification into a single process step. Another example is the combination of dry grinder and flash dryer which pulverizes, dries, and classifies a wet feed using a single compact piece of equipment.

Further cases of multiple operations in a single unit are found in the combined gas absorber and stripping tower used in conjunction with fluid-catalyst processes; and in a new disperser for paints which combines the functions of a mixer and rolls into a single piece of equipment.

This trend toward combined operations is prompted by the obvious advantages of lower investment and operating costs, and a saving of space.

CONTINUOUS PROCESSING

The trend toward continuous processing has moved at a rapid pace aided by the development of more efficient equipment, more dependable controls and an increasing realization on the part of equipment users of the manifold economies achieved by it. A marked increase in the use of continuous conveyor dryers typifies this trend. The rapid development of electronic control instruments with their advantages of greater sensitivity, more rapid response, increased ruggedness and ease of maintenance has implemented the growth of continuous processing.

This growth is particularly evident in the expanded use of continuous conveyors for handling bulk materials, in the employment of continuous and automatic weighing devices, and in the application of automatic packing machines.

Along with the usual advantages of lower costs and greater productivity, continuous processing usually brings greater ease of control and greater uniformity of product.

A picture of the modern chemical plant may be had by visualizing an extrapolation of these three trends in the application of equipment. This modern plant would probably embody a continuous process, automatically controlled, with all materials handling mechanized. It might employ processing units which combine several operations into a single piece of equipment. Perhaps it would utilize one or more of the unit operation steps recently derived from the fundamental principles of older specialized processes.

This is not to imply that a plant containing batch type processing steps cannot be modern, because there are many operations for which no adequate continuous techniques have yet been developed, and others where the use of present continuous procedures would not be economical. Nevertheless, the trends in chemical plant equipment are unmistakably in the direction of continuous operation, simplification of process steps, and the development of new techniques which will make batch operations continuous.

SIGNIFICANCE OF MINOR IMPROVEMENTS

While the major trends in equipment application signalize progress, they are, in reality, merely the culmination of many minor advances—and it is these same minor improvements that may shape the future development of process equipment. An improved bearing or stuffing box, another new alloy or plastic, an advanced equation for calculating design factors, often seem to be unrelated items of little consequence. Examination of the design engineer's problems, however, reveals how many such small improvements may be compounded into significant advances.

The designer's job resolves itself ultimately into manifold compromises of varied and diverse conditions. There is the compromise between the reaction conditions and heat transfer, diffusional effects and pressure drop. Factors which tend to improve mixing and heat transfer also tend to increase pressure drop and power costs—so there must be compromise. Conditions which would be ideal for reaction are often beyond the reach of existing techniques—another compromise.

There are compromises in materials of construction. Corrosive conditions often dictate the use of construction materials which are not amenable to the preferred methods of fabrication. Fragile materials often require special design treatment entirely apart from process considerations.

Compromises are imposed by practical considerations for facility of operation and repair. Design features which make for easy observation, inspection, cleaning and dismantling are often contrary to the best conditions for process flow and reaction, and are often conducive to higher costs. Ideals must also be compromised to make adequate provisions for safety and to allow for the human element of operating workmen. Then there is always the balance of what is desirable in design with what is economical.

With this understanding of the complex compromise nature of the design engineer's problem, it is easier to see the importance of many minor advances in theory, materials of construction and mechanical devices. Each of these little developments broadens the area in which the compromise must be made. Some of these minor improvements open new areas where a more advantageous balance can be reached. The compounded effect of many such advances produces a trend toward equipment better fitted to ideal reaction conditions and more suitably adapted to the practical operating conditions and economic requirements.

TRENDS IN PROCESS EQUIPMENT DEVELOPMENT

1. **Recent plant equipment applications disclose three important trends:**
   - (a) **Old specialized operations are being reduced to the status of unit operations.**
   - (b) **Increased use is being made of equipment types which combine several functional operations into a single process step.**
   - (c) **Development of continuous processing has progressed at a rapid rate aided by more efficient equipment, greater mechanization, and better control instruments.**
2. **Underlying these application trends are the many minor improvements which have enabled designers to produce better equipment:**
   - (a) **Developments in chemical engineering theory have improved the accuracy of designs and opened new avenues of approach.**
   - (b) **Continued introduction of new construction material has broadened the field of equipment design for special services.**
   - (c) **Many minor improvements in mechanical devices have extended range of equipment performance.**

ADVANCES IN THEORY

The continual development of chemical engineering theory has been of great importance to achievements in equipment design. A theoretical understanding is an operational tool with which the engineer can analyze a design problem and quantitatively evaluate the effects of various conditions. Theoretical considerations also aid in predicting advantageous conditions outside the range of past experience, and thus may point the way toward better techniques. With well developed theoretical tools the engineer can approach design problems on a more rational basis and can predict performance with greater reliability and confidence.

Outstanding examples of the results of the development and application of theory to design are the many specialized heat exchangers. These are tailor-made for a specific service, such the fluid-catalyst coolers for handling suspensions of powdered catalyst in process vapors and the air fin coolers for areas where water is scarce.

Advances in the theory of diffusional operations and improved understanding of reaction phenomena have brought the design of certain reactor types into the range of rational design, where the proper balance of heat transfer, reaction rate, and pressure drop can be analyzed to produce a design with the desired temperature and reaction control characteristics.

During the past year the development of certain theoretical aspects of extractive and azeotropic distillation represent new tools for process development and equipment design.

Theoretical understanding of a process is an essential step in the realization of its broad general applicability to many related operations, and a valuable tool for designing new and better equipment in the future.

NEW CONSTRUCTION MATERIALS

The restrictions imposed on the designer by corrosion problems are reducing at a rapid rate with the remarkable progress in the development of new materials of construction and improved forms of the older materials. The rapid advances made with non-metallic materials are outstanding. Pipe, fittings, valves and strainers are available in plastics, glass, graphite, and stoneware. Several good centrifugal pumps of ceramic and graphite construction are now available.

The limitations of poor heat transfer rates on many corrosive operations have been raised by the introduction of new graphite heat exchangers in a variety of forms. The makers of glass and glass-lined equipment have also done much to push back the barriers of poor heat transfer in many chemical processes.

New alloys have extended the temperature limits for chemical operations to new high and low levels. The recent advent of bi-metallic tubing in a variety of combinations has opened up new possibilities for providing specific corrosion resistance to two different chemicals, one on the inside and the other on the outside of a heat exchanger tube.

All these advances, each one small in itself, represent very significant progress, for the design engineer now has a large list of materials from which to choose, and the list is still growing.

MECHANICAL DESIGN IMPROVEMENTS

The gains in design latitude through minor improvements have also extended into the field of mechanical devices, where gradual advances in bearings, lubricants, stuffing boxes, seals, packings, and many such devices have allowed the engineer to carry chemical process equipment designs to higher and lower temperatures and pressures, and to much more severe abrasive and corrosive conditions.

Mechanical design features for connecting and protecting non-metallic pipe and equipment have had much to do with the rapid acceptance of these fragile materials.

Improvements in one type of chemical process equipment reflect improvements in the design or application of other types. For instance the introduction of a new filter capable of handling a wider range of particle sizes in the feed slurry, or a greater range of feed concentrations, eases the limitations on the performance of preceding process steps. Likewise improved features in one piece of equipment may work to advantage in the specification of

subsequent operating equipment, as in the case where a new crystallizer produces larger crystals which are easier to filter.

Thus the many minor improvements in the theoretical understanding of operation and processes, the continual development in materials of construction, and the gradual improvement of a variety of mechanical devices, have mounted to significant proportions in their cumulative effect to broaden the area in which the chemical engineer must compromise the design of chemical process equipment.

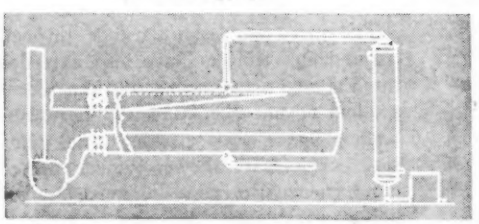
Although each individual advance is small in this evolutionary process of development, there is no doubt that there is progress. The current trends toward continuous operation, simplified process steps, and the general development of new unit operation tools, have raised chemical processing to new levels of efficiency. The continual development of many minor design features indicates that this progress will continue.

Equipment Advances 1944-45

THE broad general trends in equipment development provide a background for gaging progress and predicting the shape of the future, but it is the specific improvements and innovations in process equipment that provide the tangible tools with which chemical engineers produce the better plants of tomorrow.

In order to summarize for its readers the recent developments in equipment, CHEMICAL INDUSTRIES has conducted a survey of equipment manufacturers to ascertain what new equipment they have introduced during the past two years. This survey data has been classified into 16 functional categories. Interpretive comments by authors who are authorities in their fields point up the significant trends in equipment design, application, and operating practices.

The following pages are worthy of careful study by all readers who are interested in the production, engineering and development aspects of the chemical and process industries.



ADSORPTION

by C. L. MANTELL, New York, N. Y.

ADSORPTION has reached the accepted stage of being a "unit-operation" of chemical engineering and the process industries. Applicationwise, the War period brought forth tremendous new consumption of adsorptive desiccating agents such as those based on aluminum oxide, bauxite, and silica for the protection of equipment in transit, as well as new usage of gas and odor adsorptive materials primarily of the activated carbon type.

Design of large scale equipment employing granular adsorbents for the protection of natural gas lines, petroleum refinery by-products, the liquefaction and high-pressure storage of aliphatic hydrocarbons, and the production of very low dew point gases for treatment in industrial processing has been concerned with the reduction of blow-out losses of adsorbents, better packing, lower pressure drops, higher speeds of reactivation, and longer operating periods. A new application has been in connection with odor removal in very large air-conditioned areas, markedly reducing water and power consumption, and increasing the amount of recirculated air. Cannister type of replacable adsorbent holders were developed and used in a manner similar to that of the electric light bulb.

Equipment operating under pressures of 600 pounds with complete adsorptive treatment of engineering fluids have been developed and are in satisfactory operation.

In a related field, ion exchangers, op-

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erating or both the anion and cation cycles, are in use and it is now possible to treat an electrolyte-bearing aqueous solution to produce complete ion removal, separation of ionic constituents or addition of a specific ion to the solution. These ion exchangers are either organic resinous bodies such as phenol-formaldehyde or amine-formaldehyde, or sulfonated coal, or inorganic materials, based upon natural or synthetic zeolites.

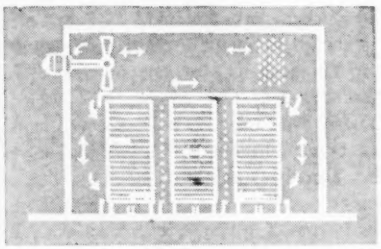
A considerable number of companies have developed processes for demineralizing water, and war-time application in small packaging units have resulted in mechanisms for the treatment of sea water to make it potable in times of emergency.

Meanwhile the application of activated carbon for water treatment has grown apace along with the development of proportioning mechanism, cleaning devices and the like, which have become wholly automatic and controlled.

The adsorbents themselves are now thought of as a physical part of the system to be considered in the same way in the fan or blower, in towers or tanks, or a length of pipe or fitting that generates pressure energy or consumes it in the course of the passage of gas or other fluids through the system in the process of treatment. The engineering properties of the adsorbents themselves are very important and are so considered.

Adsorbents must be tried out on the job; predictions as to what they will do are only of a general nature. Because adsorbents are so selective, processes function around the adsorbent, whose physical form, nature, and properties determine the equipment. Equipment design is simple; but the design and preparation of adsorbents of predetermined physical, mechanical, and chemical characteristics constitute an important problem only partly solved. The adsorbent is really part of the equipment but at the same time is a raw material consumed, slowly of course, during the processing of liquids or gases.

Many industries employing adsorbents still fail to appreciate the unit-operation nature of the process. The equipment is fundamentally the same whether it be used in petroleum, sugar, water, vegetable oils, organic acids, or salt in liquid processing; natural gas, manufactured gas, carbon dioxide, or air in gas treatment.



DRYING

by J. W. GREENE, Kansas State College, Manhattan, Kan.

RESEARCH and development work on dryer designs has been restricted during the war. However, many refinements have been made in existing types and in operating practices. In rotary dryers, the contact between the material being dried and the heated air has been improved by the use of saw-tooth type flights. These flights give a better distribution of fine materials across the diameter of the drum, increasing the efficiency and capacity of the dryer.

There has been a marked expansion of the application of continuous conveyor drying. The employment of this type of operation in the chemical process industries has made possible the attainment of large scale production with the ease of control and uniformity of product which is best achieved by continuous operation. New feeders to maintain uniform loading of the conveyor have been developed for these continuous dryers.

For longer bearing life in dusty locations, a self aligning roller for rotary dryers has been designed with the bearings inside the roller. Protective dust seals insure clean well lubricated bearings.

Infra-red radiation is being more widely employed for the removal of moisture and solvents from cellulosic and similar materials. These rays are absorbed by the solvent or moisture without objectionable heating, or where an opaque base is present, the drying is from the inside out to the surface. An interesting adaptation of this principle is a process for the drying of smokeless powder. This is carried out at low temperatures in a relatively short period of time, reducing the amount in process at any instant. For other classes of materials, a gas fired infra-red radiator

ADSORPTION—New Equipment Developed 1944-5

Type of Equipment	*Sizes*	*Construction Materials*	*New Features*	*Applications*	*Limitations*	*Company*
Laboratory deionizing unit.	12, 60 and 100 gals./hr.	.....	Water of high purity at 1-10% of cost of distilled water.	Small industrial and laboratory applications.	Water is not pyrogen free.	Illinois Water Treatment Co.
Water demineralizer.	5-450 gals./hr.	Plastic and hard rubber piping and valves in all units. Pyrex columns in small units, rubber-lined metal in large.	Four bed system gives higher CO_2 purity and greater capacity between regenerations.	Small industrial and laboratory applications.	Bacteria, organic material and silica are not removed.	Barnstead Still & Sterilizer Co.
Water de-ionization unit.	15-1,500 gals./hr.	Plastic or rubber-lined.	Produces water equivalent to distilled water at a much lower cost.	Small industrial and laboratory applications.	.....	Dorr Co.

DRYING—New Equipment Developments 1944-5

Type of Equipment	*Sizes*	*Construction Materials*	*New Features*	*Applications*	*Company*
Spray dryer.	10, 14 and 18′ dia.	Stainless steel.	Three stage drying with exhaust gas substantially at the dew point.	Dehydrating foods and chemicals where the feed is fluid.	Swenson Evaporator Co.
Spray dryer.	4′ dia.	Steel, stainless steel, or other alloys.	Complete compact unit with a wide range of operating conditions.	Small scale drying of valuable products or pilot plant test work.	Western Precipitation Corp.
Steam-tube rotary dryer.	36″ dia. x 20′ to 90″ dia. x 60′.	Steel, stainless steel, nickel.	All parts in contact with material made of corrosion resistant alloy, low dust loss.	Drying wide range of powdered or granular materials.	Hardinge Co.
Heated platen dryer	Practically any size can be made.	Steel, alloy steels, and clad stls.	Labyrinth type platen for circulating steam, heating or cooling medium; made of 3 plates rolled together, the center plate cut to form a labyrinth path.	Processing chemicals, rubber, plastics, plywood, etc. Temps. up to 700°F and internal pressures up to 1000 p.s.i.	Lukens Steel Co.

is being used, which has the advantage of using a cheaper source of energy.

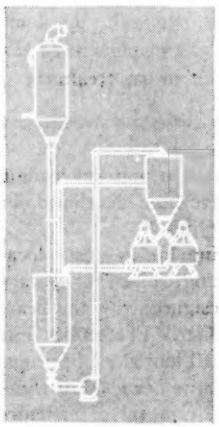
Lower moisture contents in hygroscopic materials are being obtained by the use of dehumidified air. Adsorbents such as silica jel, activated alumina, or treated clays are used to reduce the humidity of gases to essentially zero. Liquid organic chemicals and transformer oils are completely dried by passage over these adsorbents. Where absolutely dry organic liquids are required this method of drying is of great value.

In the design of dryers using dried air, equilibrium moisture data have proven to be of great assistance. At low moisture levels, the driving force is small and it is essential that the most efficient utilization be made of this driving force.

Wider application has been made of direct-fired heaters. Better burner design, premixing of gas and air required for combustion and high-temperature combustion zones completely remove deleterious compounds from the products of combustion. These gases may be used in direct contact with food products without affecting the flavor or food value. The direct-fired heater has great advantages in fuel economy and flexibility of operation.

The military demand for dried foods gave great impetus to that industry. Better operation and more uniform products have been obtained by increased instrumentation. Several processes involving drying from the frozen state have been developed for the purpose of better preserving the fresh flavor.

The past several years have been devoted to refinements of designs, to better control of operating conditions and the improvement of products.



CRYSTALLIZATION

by H. B. CALDWELL,

Swenson Evaporator Co., New York, N. Y.

DURING the past few years, there have been two noteworthy trends in crystallization practice. This discussion will consider crystallization as the process of producing crystals by cooling a solution.

One significant trend has been the accelerated acceptance of the vacuum crystallizer wherein cooling is accomplished by vaporizing a portion of the solvent, thus removing sensible heat as latent heat of vaporization. In the vacuum crystallizer, no heat transfer surface is required, which accounts for its many advantages over other types.

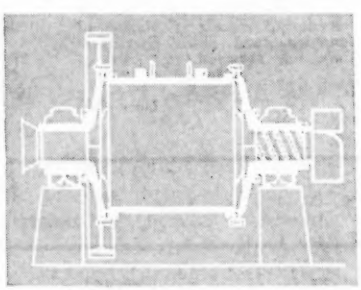
Overall considerations show that the vacuum crystallizer is usually less expensive in first cost, it occupies less floor space, it costs less to operate, and it produces a superior product. Other specific advantages are: (1) it can cool to lower temperatures than the available cooling water by use of a steam jet vapor compressor; (2) rubber lining for corrosive solutions can be used since no heat transfer surface is involved; (3) the cooling is accompanied by inherent evaporation amounting frequently to 4 to 6% of the weight of the solution cooled, which is an appreciable credit to any process requiring both cooling and evaporation; (4) its capacity is constant since there are no heat transfer surfaces to become fouled and thus reduce the rate of cooling; (5) dirty, salty, or scale-forming cooling water is entirely satisfactory.

The other distinct trend in crystallization concerns production of "larger" size crystals for many bulk chemicals, namely 10 to 20 mesh size or larger, instead of 60 to 200 mesh.

There are several important economic advantages inherent in the "larger" crystals. During manufacture: (1) larger tonnage and (2) lower moisture are obtained from a given size rotary vacuum filter or centrifuge; (3) less wash water is required; (4) dryer capacity is higher; and (5) less heat is needed in the dryer. During handling: (6) less dusting occurs; and (7) there is less tendency to cake in storage and during shipment.

The design of vacuum crystallizers is sufficiently advanced to be thoroughly dependable. They are built for either batch or continuous operation, the latter being either single or multi-stage.

The design of crystallizers to produce the "larger" crystals frequently involves experimental work with the specific solution. Impurities, temperature, concentration, and other factors greatly influence crystal growth.



GRINDING

by S. B. KANOWITZ, Raymond Pulverizer Division
Combustion Engineering Co., Inc., New York, N. Y.

IT IS not possible to treat of recent developments in pulverizing without at **least** ***mentioning*** the changes in preliminary or supplementary equipment used in the pulverizing process.

Drying, screening and air separating equipment have been greatly improved and may be incorporated in the operation so that the entire process may become continuous. This saves a great deal of labor formerly required to handle the materials where they had to be handled in batches after each step.

It is now possible with many chemicals to use a continuous filter or centrifuge which discharges the solids directly into a unit which continuously pulverizes, dries, conveys, air separates/or screens and discharges a dry material of the proper particle size direct to the bagging or packaging machinery.

The wet feed enters the mill system where it is dried and pulverized, conveys it to a collector which drops the material into an air separator which may reject certain oversized particles or impurities. All of the gases used for drying with the water vapor are filtered through a cloth filter so that the entire operation may be dustless.

As far as pulverizing equipment proper is concerned there has been very little development in new types but mostly a modification of older types. Modifications

of the jet type of pulverizer such as the micronizer have appeared but they are still in the laboratory stage and a great deal of development work will have to be done before they will be for standard commercial use.

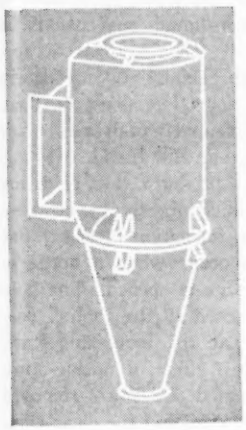
The trend has been to develop a pulverizing system to deliver an extremely fine product as there is a great demand in the chemical industry for pulverized materials of extreme fineness.

Among recent developments in the field of fine grinding we may mention the Mikro Atomizer brought out by the Pulverizing Machinery Company where the fineness is obtained by imparting a centrifugal action to the pulverized particles of which only the extremely fine particles are removed by a current of air which counteracts the motion of the larger particles and forces them back to the grinding media.

Here the fineness is obtained by the use of their whizzer system of separation; the hammers, whizzers and fan all rotate in a horizontal plane, the pulverized material travels vertically upward against the centrifugal action imparted to it so that the particles of extremely small mass pass through and are discharged.

Summing up, we would say that the trend in pulverizing is to produce a much finer product than had been the practice in the past and wherever possible to combine the drying, pulverizing and conveying in one continuous system.

In this connection, we might also mention that many chemicals are kept cool while being pulverized by grinding and conveying them in a system into which refrigerated air or gas has been introduced.



DUST COLLECTION

by V. W. WILSON,
New York, N. Y.

WITH the advent of so-called fluid catalysts in petroleum cracking and organic syntheses, the problem of separation of solids from gases has become increasingly important. Highly efficient separation is essential for obtaining satisfactory catalyst recoveries, and for the production of the desired gaseous reaction products relatively free from entrained catalyst.

It is of interest that existing types of dust collection equipment have been utilized although the problem here is one of separation of relatively large quantities of solids from relatively small quantities of gases, existing collectors being designed primarily for the separation of a small quantity of solid material from a large amount of gas. In order to effect the desired degree of dust removal, at times it has been necessary to employ two or more methods in series. This procedure has proved to be reasonably satisfactory.

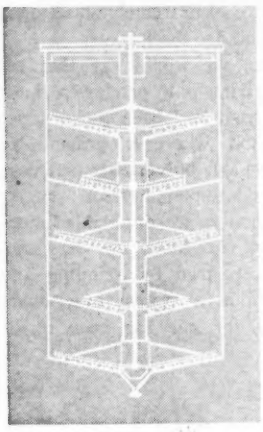
Much effort has been expended on improvement in materials of construction, increased corrosion resistance and improvements in the attrition characteristics of the separator. Although some success has been achieved in this direction, it is noteworthy and regrettable that comparatively little work has been done on the development of new principles of separation. The relatively meagre published information on the subject bears a striking similarity to the information already compiled in the more prominent chemical engineering reference books.

GRINDING —New Equipment Developed 1944-5

Type of Equipment	*Sizes*	*Construction Materials*	*New Features*	*Applications*	*Limitations*	*Company*
Ultrafine pulverizer	150-1200 lbs./hr. thru 325 mesh.	Ni-Resist and stainless steel, and complete stainless steel.	Integral pulverizer and separator, particle size down to ½ micron average, 5 micron maximum.	Pigments, dyestuffs, and insecticides.	Dry grinding only— no abrasive materials.	Pulverizing Machinery Co.
Grinding mill.	.....	.....	No moving parts— utilizes attritive action of particles carried by air stream. Down to 1-2 microns.	Graphite, prussian blue, and iron.	.....	International Ore Corp.
Rotary knife chopper	200-400 lbs./hr.	Steel.	Rotary cutterblades reduce fines to a minimum in granulation of plastic scrap.	.....	.....	American Pulverizer Co.

DUST COLLECTION—New Equipment Developed 1944-5

Type of Equipment	*Sizes*	*Construction Materials*	*New Features Applications*	*Company*
Wet process collector	2000-30,000 cfm.	Steel, stainless steel, monel and aluminum.	Dust removed as sludge which is drained to dewatering tank and water recirculated. No moving parts, bags, screens, spray nozzles or dust fans.	Whiting Corp.
Unit type multi-wash collector.	400-5000 cfm.	.....	Compact unit.	Claude B. Schneible Co.
Roto-Clone.	1000-25,000 cfm.	.....	Uses both centrifugal force and mixture with water to collect flammable and linty dusts, and corrosive gases.	American Air Filter Co.
Tubular dust collector.	60.8 sq. ft. filter area	Cloth filter.	Tubular design of filter surface provides much filter area in a small pace and allows cleaning of surface from outside by shaking.	Dust Filter Co.
Portable dust collector.	One model handles 5000 cfm.	.....	Utilizes centrifugal separation followed by filtration through 60 mesh filter cloth.	Dust Filter Co.
Portable dust collector.	500 cfm	.....	Dusty air passes through twin cyclones then through a viscous coated filter.	Ideal Commutator Dresser Co.
Unit type dust collector.	1000, 2000 and 3000 cfm.	.....	Easily moved and utilizes cyclone action followed by cloth filter.	Pangborn Corp.



SEDIMENTATION AND CLASSIFICATION

by R. P. KITE, Dorr Co., New York, N. Y.

ANYONE making a casual review of the new process or apparatus developments which have taken place during the past two years in the unit operations of sedimentation and hydraulic classification might well conclude that there have been no new basic improvements. The new developments have been few, due partly or entirely to the fact that, during the war years, the research and development organizations of equipment manufacturers have necessarily been drafted for directly productive activities.

Another factor is that chemical and allied companies who normally are interested in collaborating in piloting new equipment ideas have likewise been unable to undertake such projects unless they were imperative in war production.

There have been developments, however, in sedimentation and classification, which are important to the industries in which they have been applied, even though, in some cases, they represent a refinement or improvement of some old basic idea.

In the field of sedimentation, one definite trend during the past few years has been toward the "conditioning" of the suspensions fed to sedimentation units. "Conditioning" in the sense used here means the pre-treatment of a solids-in-liquid suspension whereby the suspended solids are caused to settle at a rate faster than normal, or the production of a clearer effluent, or both. The "conditioning" may be entirely mechanical or a combination of mechanical and chemical means.

An example is the device known as the Multifeed Clarifier as used in the cane sugar industry. This device is a multicompartment sedimentation unit designed for continuous flow, but with a special top compartment into which all the feed is introduced for conditioning prior to transfer to the sedimentation compartments below. The flocculator mechanism in the conditioning compartment increases the probability of particle collision and adhesion, so that the settling rate of aggregates is obtained rather than the rate of individual particles. It is obvious that once a rather fragile aggregate of particles is formed, the suspension must be transferred to the sedimentation compartments under low velocity conditions which will not destroy the "floc" structure. The over-all benefit obtained by this development is increased capacity per unit of floor space and less turbidity in the juice going to subsequent operations.

The same broad idea has been used in recent years in the production of magnesia, the treatment of oil refinery and other industrial wastes, and in the sanitation field where it is particularly valuable in purification of surface water supplies.

It seems advisable to stretch the title of a review on this subject to include those relatively new devices which remove solids from suspensions by causing the solids to float to the surface rather than settle to the bottom of a sedimentation unit. This principle is applicable to those solids-in-liquid suspensions in which the "solid" has an apparent specific gravity approaching 1.0, or where the "solid" has normal tendency to float. The tendency to float is accelerated many times by saturating the liquid with air or gas at a given pressure, then releasing the suspension at a slightly lower pressure causing the formation of many fine bubbles such as occur when a bottle of carbonated beverage is opened. The bubbles become attached to the "solid" particles and rise at an increasing rate, giving the over-all effect of upside-down settling. The floated solids are removed by a skimming device, and the clear effluent is withdrawn from some point beneath the surface. The Vacuator, as used in sewage treatment, and Pedersen and Adka savealls as used in paper mill whitewater recovery are specific examples.

The "sludge blanket" type of clarification device is sufficiently new to mention here. These are identified as the Precipitator, Accelator, and the Hydro-Treator, and were first developed for lime softening of hard water supplies. The hard water and required amount of milk-of-lime are introduced at or near the bottom, the precipitated lime forming a fluid sludge bed and zone of lime supersaturation through which the water must pass prior to discharge from the device. A portion of the sludge is withdrawn periodically or continuously as required. Recently, this type of equipment has been

SEDIMENTATION AND CLASSIFICATION—New Equipment Developed 1944-5

Type of Equipment	*Sizes*	*Construction Materials*	*New Features*	*Applications*	*Company*
Classifier.	6" to 60" dia. screw in simplex design 24" to 60" dia. in duplex design.	Steel.	"Spiral" type classifier with cross-flow operation; uninterrupted flow of pulp and no submerged bearing.	Hydraulic classification of minerals and other solids.	Denver Equipment Co.
Classifier.	.....	Steel.	"Hydrosizer" utilizes principles of hindered settling, using very sensitive automatic control to maintain uniform operation when feed varies.	Hydraulic classification of minerals, etc.	Dorr Company, Inc.
Trickener and hydroseparator.	20′ to 350′ dia.	Steel and cast iron.	New hydraulic lift feature.	Cement, metallurgical and chemical processing.	General American Transportation Corp.
Sludge collector.	Two sizes: Type "B" for tanks less than 55′ dia., type "A" for tanks up to 115′ dia.	Steel.	A rotating bridge carrying a scraper conveyor for moving sludge to the center of thickeners, produces less disturbance and permits bottom introduction of feed.	Sewage disposal thickeners and other thickening operations.	Link-Belt Co.
Clarifying centrifuge.	400-6,000 gal. per hr.	.....	Disc type ("Nozzle-Matic") centrifuge with new design bowl nozzles and automatic valves to discharge greater amounts of solids.	Essential oils, fish oils, wool-grease, yeast, etc.	DeLaval Separator Co.
Suspended Centrifugal.	400-4,000 gal./hr.	.....	Bowl type (Multi-Matic) simultaneously discharging conc. solids and clear liquid continuously. Operates at higher than average r.p.m.	Proteins from soy bean, distillery slop.	DeLaval Separator Co.

used for clarification of whitewater from paper mills, and in this application, the "sludge blanket" is used to trap the finer suspended solids.

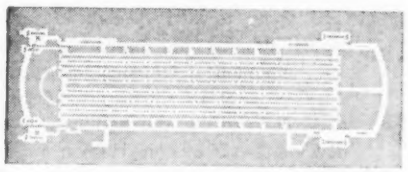
An interesting development in tray thickener operation was used in the Fluid Catalyst cracking units in oil refineries during the past few years. The thickeners were operated in an oxygen free atmosphere and under pressure, with appropriate auxiliaries to continuously remove the clarified oil and sludge of recovered catalyst.

In the field of hydraulic classification, the Dorrco Sizer with automatic controls was developed during the war for reclamation of additional iron ore from washing plant tailings, and for reclamation of extremely critical abrasive grains, in the latter case producing several bands of grain sizes ranging from 147 to 25 microns.

The Bird Continuous Centrifugal has been proven as sizing device, and while its largest application has been in the micron range, it has also been used for separations at about 200 mesh.

There are two relatively new devices which, strictly speaking, belong in the field of concentration rather than classification. One is the Humphrey's Spiral, used, for example, in the recovery of ilmenite sand, operating information concerning which has been published. The other is the Selective Media Concentrator, a new development undergoing commercial scale tests on the Iron Range in Minnesota, recovering iron ore in the size band of approximately 6 mesh to 1½".

Because of the fact that many research and development programs have been deferred during the past few years, it is only natural to assume that the next year or two should produce important new developments in equipment in these unit operations of sedimentation and hydraulic classification.



HEAT EXCHANGE

by J. R. MILLER, United States Army

PROGRESS in the development of heat exchange equipment during the past two years has been marked by a trend toward specialized functional designs for many applications, and increasing standardization of construction features. Radically new designs have been few, but the meager information released thus far in the atomic bomb development hints at a signal advance in design. A recent official statement on the Manhattan project says, "a brand new type heat exchanger was conceived—and developed up to the production stage."

Rapid strides in the derivation and application of the theory of heat transfer has placed the design of heat exchange equipment for special services on a rational basis. This trend is evident in the increasing use of air-cooled, extended-surface heat exchangers of both the finned tube, and grille or honeycomb types, in applications where water is scarce or unsatisfactory. Such units have found application as jacket-water coolers, lube oil coolers, and in certain cases as coolers and condensers for refinery products. The "Contactor Cooler" is another specialized design employed primarily as a heat exchanger-reactor. This compact unit, which combines circulation and mixing

HEAT EXCHANGE—New Equipment Developed 1944-5

Type of Equipment	*Sizes*	*Construction Materials*	*New Features*	*Applications*	*Company*
Air-cooled condenser or cooler.	Range of sizes.	Heat transfer elements supplied in various ferrous and non-ferrous alloys.	"Package type" unit complete with finned tubes, fan, drive and supports. Forced draft makes operation independent of wind.	Cooling and condensing process vapors and liquids.	The Griscom-Russell Co.
Duplex condenser tubing.	Most common sizes.	Combinations of admiralty, red brass, cuzinal, cupro-nickel, Muntz, Duronze IV with steel, aluminum, stainless steel or monel.	Provides a combination of corrosion resistance to two different fluids in the same tube.	Heat exchangers for chemical and process industries.	Bridgeport Brass Co.
Duplex condenser tubing.	Most common sizes.	Alcoa and Alclad 3 S.	Inside of Alcoa tube lined with 3 S alloy, the two metals being metallurgically bonded.	Tubes for NH_3 condensers and absorbers. No better than other Al alloys for alkaline waters.	Aluminum Co. of America.
Shell and tube heat exchanger.	20 to 390 sq. ft. of surface. Tubes ½" to 2" dia. in bundles 10" to 29" dia. up to 6 ft. long.	"Karbate."	Available in fixed tube sheet, outside packed floating head and inside floating head styles, and with segmental or orifice baffles.	Heating, cooling, or condensing most corrosive chemicals up to 170° C.	National Carbon Co.
Finned tube, shell & tube exchanger.	From 10 to 95 sq. ft. of finned tube area per ft. of length.	Copper, aluminum, red brass, cupro-nickel, steel, and stainless steel.	Fins made from the tube wall metal. Ratio of outside to inside area is small.	Condensing and cooling clear liquids.	Downingtown Iron Works.
Shell & tube heat exchanger.	5 to 1200 sq. ft. of heat transfer area.	Steianless steel, steel and combinations with non-ferrous alloys.	Available in four styles: fixed tube sheets, internal and outside packed floating heads, and "U" bundle. All van-stoned construction.	General heat exchanger service.	The Pfaudler Co.
Trombone cooler.	1", 1½", and 2" tubes up to 6' length per pass.	"Karbate."	Both cascade and double pipe types, with outer pipe of "Karbate" or metal.	Heating or cooling most corrosive chemicals up to 170° C.	National Carbon Co.
Plate type exchanger.	3.8 to 13.5 sq. ft. per unit.	"Karbate."	Corrugated plate with internal channels for circulation of heat transfer medium.	For heating or cooling tanks as in pickling, etching, plating, etc. Pressures up to 50 p.s.i. and temps. to 275 or 300° F.	National Carbon Co.
Bayonet heater.	2" to 4" O. D. up to 6' long.	"Karbate."	Designed for insertion into tanks and equipment through nozzles or stuffing boxes.	For heating most corrosive chemicals up to 170° C.	National Carbon Co.
Combustion immersion heater.	.....	"Karbate."	Submerged gas burner operated inside a "Karbate" pipe.	For heating most corrosive chemicals up to 170° C.	National Carbon Co.
Wax cooler.	Built for any size wax cakes.	Galvanized iron, or other metal.	Rapid water cooling with individually cooled chambers which are easily opened.	Wax mfr. or processing.	T. Shriver & Co.
Dielectric heating unit.	1, 2.5 and 5 KW units, any size on special order.	.....	Simplified control.	Evaporating and drying.	Radio Receptor Co.
Dielectric heating unit.	400 watts.	.....	High rate of heating, automatic control.	For heating plastic preforms for press molding.	Girdler Corp.
"Dowtherm" heating unit.	30,000 to 2,000,000 B.t.u. per hour.	Steel.	Easy cleaning. Does not require licensed operator.	For high temperature heating at low pressure.	Eclipse Fuel Engr. Co.

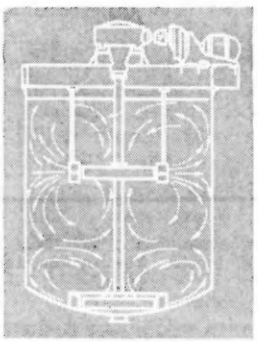
with rapid transfer of reaction heat, consists of a vertical shell and bundle of double tubes in which the heat transfer medium passes down the central pipe and returns through the annular space. Circulation is provided by a propeller agitator at the base. The "Fluid Catalyst" cooler is a special design which accommodates large flows of a catalyst-gas mixture, at large temperature differentials with a minimum pressure drop. In this design stratification is minimized by avoiding sudden changes in direction of flow.

The development of new mechanical design features has resulted in further specialized units. One new type, the "Transfer Line Heat Exchanger," is a compact design for handling high pressures (800-1,000 lbs. per sq. in.), at temperatures up to 1,000° F., with temperature differentials of 600 to 1,000° F. between the heating and cooling fluids. Excessive thermal stresses are avoided by eliminating tube sheets, using instead a series of tubes in a shell—one tube per pass—with header type connections between tubes. Finned tubes of the cross fin and longitudinal fin types are finding increasing applications to special cases where there is a low heat transfer rate on one side. Internal, longitudinal fins are in the development stage.

The general trend toward specialized designs has been implemented by the continued application of new materials of construction. Bimetallic tubes are finding increased usage in cases that involve different corrosion problems with each of the fluids handled. Alloy steels and non-ferrous alloys are finding extensive applications at sub-zero temperatures ranging from —50 to —300° F. Where maximum weight and space are important aluminum and magnesium alloys are used. There has been a marked increase in the use of plastics, glass, rubber, and graphitic materials where special corrosion problems are encountered. Quite notable along this line are the two "Karbate" heat exchangers, one comprised of round tubes, and the other an extendtd surface type having a corrugated flat plate.

There is an increasing trend among the users of heat exchange equipment to specify design in accordance with the standards of the Tubular Heat Exchanger Manufacturers Assn., although many continue to formulate their own specifications based on A. P. I.—A. S. M. E. code. The policy of prescribing standardized design features to achieve interchangeability of units and parts is increasingly apparent among the larger and more experienced users. Coupled with this policy is a growing practice among users of keeping running service records on each unit as a means of anticipating cleaning, maintenance, and replacement periods. There is also a tendency to provide extra tube sheet thickness to restrain bowing of the tube sheet during repairs such as retubing or rerolling of tube joints. In summary there are two dominant trends in heat exchanger design:

1. The trend toward specialized functional designs as implemented by advances in heat transfer theory, by developments in mechanical design features, and by the application of new materials of construction.
2. The trend toward standardization of design features resulting from experience and prompted by desire to obtain interchangeability.



MIXING

by E. J. LYONS, Turbo-Mixer Corporation
New York, N. Y.

THE last two or three years have offered many opportunities for the application of the latest advances in mixing equipment design. Although not all developed during this period, a list of recent units would include the Patterson cone for handling fibrous slurries; the Mixing Equipment disperser and the Brumagin radial propeller, both of which combine high shear intensity and low volume circulation; and the Turbo-Saturator for gas scrubbing. The Cornell machine, used in grease manufacture, has been applied to the blending of multi-component oils and utilizes a thin, high velocity film to accomplish its purpose. Another new machine is the Baker Perkins disperser for the blending of paint pigments into the vehicle and combining the functions of the rolls and mixers. The recent bottom fin design of Turbo gas impeller has increased the efficiency and flexibility of this unit for gas absorption. It has also been applied to flotation with outstanding results.

The increase in mixing operations in war industries has accelerated the trend toward continuous treatment when advantageous and the wider use of properly engineered designs. More attention has been given to the economy of correct design and to the specialized knowledge of the equipment manufacturer.

Generally, standard equipment is being successfully used based on the experience of the manufacturer in similar operations in totally unrelated industries. The synthetic rubber industry is an excellent illustration. Outstanding examples are the three phase reaction in one method of styrene manufacture and the continuous extraction of butadiene in the liquid phase process. Several of the production steps for both Buna and Butyl rubber required similar novel treatment.

Expansion in the metallurgical field involved the development of many new liquid phase processes for the recovery of low grade and new ores. Mechanical handling of steps such as the continuous carbonation of dolime and the subsequent

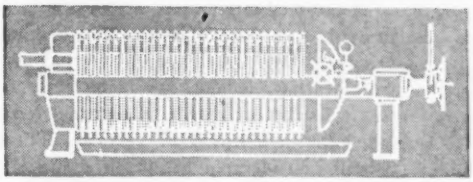
MIXING—New Equipment Developed 1944-5

Type of Equipment	*Sizes*	*Construction Materials*	*New Features*	*Applications*	*Company*
Dispersion Mixer.	10-150 gals.	Steel, stainless steel, monel, bronze and aluminum.	Close temperature control.	Dispersion of pigments in resin enamels.	Baker-Perkins, Inc.
Top Entering Impellers.	To specifications.	To specifications.	Turbine type impellers.	.....	Mixing Equipment Co.
Side Entering Mixers.	12"—28" impeller.	Steel, stainless steel, bronze and special alloys.	Hard - surfaced shaft, spring-backed and repacked from outside.	For use in large tanks and where headroom is low.	Mixing Equipment Co.
Aeration Units.	Opening 12¼" square.	Cast iron.	One or more units can be attached to sides of existing bins or silos to permit use of a gas in the agitation of finely divided solids.		Fuller Co.
Change drum tumbler.	Handle one 55 gal. drum.	Steel.	Removable drum feature allows mixing in suppliers' drums.		Vol-U-Meter Co.
Drum tumblers.	Handle one 30, 35 or 55 gal. drum @ 30 R.P.M.	Steel.	Removable drum feature allows mixing in suppliers' drums.		U. S. Stoneware Co.
Drum rollers.	Handle 1-4 55 gal. drums weighing 1,000 lbs. drum @ 30 R.P.M.	Rubber wheels on steel shaft.	Adjustable wheels.	.....	U. S. Stoneware Co.

neutralization step in the recovery of magnesium, and the continuous gas-liquid leaching of nickel ore were innovations.

In the rayon industry progress in the replacement of the sigma arm mixer by the centrifugal type for the preparation of cellulose acetate solutions is continuing.

A new industry that has rocketed into large production units in the last two years is the manufacture of penicillin and other anti-bacterials. Of the many mixing operations involved only one, fermentation of the mold, was entirely new. Mechanical agitation has seldom been used for fermentations but proved particularly important in reducing the growth cycle of the mold and increasing the activity of the product. Mixer designs have been continually revised as operating technique, chemical control, and mold strains have been improved.



FILTRATION

by CHARLES P. BONILLA, Johns Hopkins University, Baltimore, Md.

A NUMBER of improvements have been made in the field of filtration equipment, although no radically new development has been announced during 1944 and 1945. Several types of filters have found wide use in the larger war industries.

Rigid filter media have probably received the most attention. For instance, vibrating dewatering screens of several types were adapted for filtering GR-S synthetic rubber. Some units are similar in design to suspended laboratory sieve shaker, with a motor-driven unbalanced wheel prducing a rotation of the screen in a horizontal plane, other units come suspended, or floor mounted, with the rotary motion in a vertical plane. When handling a suspension of particles which coalesce or mat together, fine particles are trapped by the others and the filtering efficiency may be good for particles much finer than the screen openings. These screens are also suitable for recovering cotton linters, solid materials in vegetables and fish oils, cannery wastes, distillery slop, oversize in grinding mill discharge, etc.

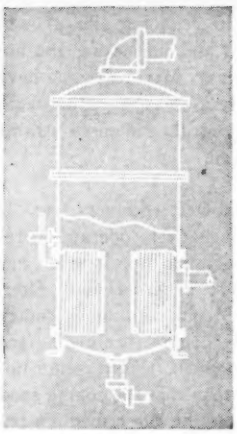
Continuous rotary filters also show advances. A new horizontal rotary filter has a rotating table divided underneath into segments to which vacuum is connected and from which filtrate and wash waters may be separately removed by means of an automatic valve, as in the usual drum type continuous filter. The cake is removed by rotating screw placed radially over the table. Dewatering capacity and washing efficiency are high for granular solids. One manufacturer has announced a line of completely factory-assembled vacuum drum filters mounted on a steel base with pipe and electrical connections installed compactly yet accessibly, including pumps, blower, receivers, etc. It is thus practically ready to operate on receipt. The most original development has probably been the "Syncro-Drum" filter. This is a double drum continuous rotary vacuum filter, the drums forming a feed reservoir between them. They rotate upward and outward, so that the coarse sand in the feed precoats the filter medium before it reaches the slower settling slime. This filter would thus work particularly well on slurries containing wide ranges of particle sizes, giving increased capacity and less sliming of the filter medium.

Filters using rigid porous media have been further developed. Porous carbon and graphite have been made available as tubes of different diameters and pore sizes, particularly suitable for corrosive service. Filters employing tubes of porous stone and fine screen wire are also available. The tubes are mounted vertically in a pressure-resisting shell so that they can be back-washed by manual or automatic action.

One concern has introduced a pressure leaf filter in a vertical tank which can be provided with individual outlets and sight glasses for each leaf, and a quick-opening cake removal door used with back-washing. It is specially suitable when filter-aids are used, for which operation a filter-aid feeder is available.

FILTRATION—New Equipment Developed 1944-5

Type of Equipment	*Sizes*	*Materials of Construction*	*New Features*	*Applications*	*Company*
Dewatering screen.	16"x30" to 72"x90" Single and multiple decks.	Steel, stainless steel and copper alloy.	Completely enclosed unit. Very fine mesh screen.	Dewatering of fine solids, especially where vapor must be enclosed.	Robins Conveyors, Inc.
Dewatering screen.	27½"x35".	Steel.	Automatic Discharge.	Dewatering synthetic rubber and food products.	Great Western Mfg. Co.
Rotary hopper dewaterer.	2' dia. x 1' to 11'6" dia. x 16'.	Steel and other machineable metals.	Removable fins.	Dewatering matls. in chemical and metallurgical industries.	General American Transportation Corp.
Rotary vacuum disc filter.	4', 6', 8'-6" and 10' dia. discs.	Steel and other machineable metals.	Trapezoidal disc design.	Filtration in chemical and process industries.	General American Transportation Corp.
Horizontal rotary vacuum filter.	Up to 165 sq. ft. of filter area.	.....	Circular, horizontal rotary table divided into segments connected to an automatic valve to separate filtrate and washes.	Filtering or dewatering mineral or crystalline matls. that settle too rapidly for vacuum drum filter pick-up.	Oliver United Filters, Inc.
Rotary vacuum filter—complete assembled unit.	.....	.....	Complete unit with all pumps, drives, blowers, etc., mounted on a common base; piping and wiring in place.	General service where easily installed "packaged" unit can be used.	Eimco Corp.
Suspended centrifugal.	26" dia. basket.	Rubber covered iron and steel.	Pilot plant unit with variable speed drive and fume tight cover.	Solids concentration and separation.	Tolhurst Centrifugals Div., American Machine & Metals, Inc.
Pressure leaf filter.	Built to order.	Stainless steel (all types) Everdur, Herculoy, nickel monel, inconel and steel.	Vertical cylindrical pressure vessel with vertical, rectangular leaves. Can be provided with jacket and filter aid feeder.	Filtration of chemicals, foods, beverages, etc., especially where filter aid is used.	Niagara Filter Corp.
Automatic pressure filter.	70 sq. ft. of filter area.	Iron body with porous stone elements.	Automatic backwashing of tubular porous elements.	Clarifying caustic and alkaline liquors.	R. P. Adams Co.
Twin line filter.	3 sq. ft. of filter area.	Iron body with porous stone, porous carbon or monel screen elements.	Self-contained unit that is easily back-washed.	Primarily for water clarification.	R. P. Adams Co.
Porous filter media.	Flanged tubes 1¼" to 6⅝" O.D. and 4" to 36" long.	Porous carbon and graphite.	Comes in six grades of varying porosity and pore size.	Corrosive acid and alkali service up to 175°C.	National Carbon Co.
Polishing filter.	24", 30" and 36" dia.	Steel, bronze, and stainless steel.	One-piece screen frames, rounded corners, and improved outlets.	Chemicals, food products, and beverages.	Enzinger Union Corp.
Polishing filter.	13½" square and 18" square.	Stainless steel, nickel-plated bronze.	Rubber washers eliminated.	Drugs and beverages.	F. R. Harman & Co.
Cartridge line filter.	20 to 50 sq. in.	Stainless steel, bronze and steel.	Uses paper, cloth or screen as desired.	Fuel oil, gasoline, chemicals.	Sparkler Mfg. Co.



EVAPORATION

by W. L. BADGER, Ann Arbor, Mich.

DURING the past two years there have been no radical changes and no important innovations in the design of evaporators. The types now used are essentially those that have been in use for some time.

With rising fuel costs, there has been a tendency to use a larger number of effects in any given installation. This is noticed principally in new installations; but there has also been a tendency to add effects to existing evaporators for the sake of increasing steam economy.

The old standard short-tube vertical evaporator with the central downtake remains just about the same as it has been for many years, except that there has been a tendency to put larger amounts of power into the propellers where artificial circulation is used.

The standard horizontal-tube evaporator has almost entirely disappeared, at least so far as new installations are concerned. Of course, many of these old horizontals are still in operation, but, as they wear out, they will be replaced with other types.

The long-tube vertical evaporator with natural circulation is still the most important evaporator for all cases where salting or scaling do not occur. There is a noticeable tendency to offset the heating element and have it discharge tangentially into a chamber, which acts as a separator for vapor and liquid. This separator can be made much smaller than the vapor head of the old design, so that offsetting the heating element has not only made the tubes more accessible, but has made the construction cheaper.

The forced-circulation evaporator is at present in a state of flux. The original designs, which called for an internal vertical heating element, are being replaced to a considerable extent by external heaters, either horizontal or vertical. There is still considerable argument as to the relative advantages of these latter two arrangements. Another tendency very marked in recent months is to use larger diameter tubes and cut down the velocity.

In the field of special materials, the most important innovation is the use of Karbate tubes for the handling of acid liquors. Fastening Karbate tubes in a Karbate tube sheet is not practical for large installations, because of the impossibility of making repairs in the field. Consequently, the general use of Karbate tubes in an evaporator has been dependent on developing a satisfactory method for sealing Karbate tubes into a metal tube sheet. This has been very successfully accomplished by one concern (U. S. P. 2,281,594), but other concerns have gone about it differently, and, the writer understands, have had some success.

SAFETY

by NED H. DEARBORN, National Safety Council, Chicago, Ill.

THE chemical process industries now enjoy a safety record considerably better than the average for the industries reporting to the National Safety Council and have enjoyed such a position for many years in the past. A consistent record of this sort in an intrinsically hazardous industry is not produced by chance. There are no doubt a considerable number of factors involved in its production but one factor of major importance has been the excellent work of the safety and process engineers in the industry in building safety into the process and into the plant before the operations are started. This has been done so effectively that the Editor of our Chemical Section News Letter complained about a year ago that he had not had a typically chemical accident to report upon for months. Whether or not this complaint was entirely justified by the fact, it did emphasize the point that the special hazards of the chemical process industries have been controlled until they are of small importance in the accident rates as compared to hazards common to all men and all industries such as tripping and falling or dropping objects being handled.

A dramatic example of the operation trend is provided by comparison of the production of explosives in the recent war with the production of the same items in the war of 1914-18. Production in the period 1914-18 was largely in open apparatus with movement of materials from process to process by hand. Accidental injuries and illnesses were at the high rate which now would be expected from such methods and productivity was not particularly high. The same or similar operations in the past five years have been carried out in totally enclosed equipment with automatic or semi-automatic control and with mechanical methods for transferring materials. The number of chemical deaths has been a small fraction (less than $\frac{1}{25}$) that of the previous period although much larger amounts of material have been handled and the less serious injuries have been correspondingly reduced.

There is a general tendency toward

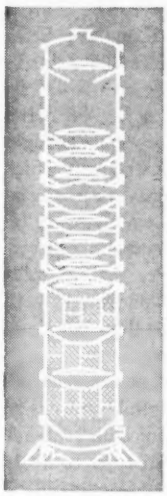
SAFETY—New Developments 1944-5

Type of Equipment	*New Features*	*Company*
Fog-free goggles.	Normal breathing sweeps new air across lens to remove moisture before it condenses. Filter pads at intake for use in dusty air.	Welsh Manufacturing Co.
Foamite delivery chamber.	Allows delivery of Foamite to burning oil chambers without loss of pressure.	American-La France Foamite Corp.
Dual stream extinguisher nozzle.	Dual nozzle permits application at either long (45 ft.) or short (15 ft.) range.	Ansul Chemical Co.
Mercury vapor detector.	Measures concentrations of mercury vapor from 1 part in three million to 1 part in two hundred million by phototube measurement of ultraviolet light scattering.	General Electric Co.

improvement in the comfort and efficiency of the articles of personal protective equipment which are generally recognized as safety devices. This is seen in new or improved materials such as the light fabrics recently developed for acid hoods, aprons, and other clothing. Equipment of these lighter fabrics gives the same protection with a fraction of the weight of the earlier models and with correspondingly less inconvenience to the workmen.

The same tendency is seen in the design of many other items. The face shields which are being widely adopted for protection of the face and eyes on jobs where the only hazard is from flying light objects or sparks provide much better ventilation than would the traditional goggles and hood or even goggles and shields. They do not provide as complete protection as does the more conventional equipment but many safety directors are coming to believe that it is desirable to have somewhat less perfect protection on all workmen rather than to have complete protection on some.

Many further advances which have been produced by the application of plastics to the fabrication of safety equipment could be cited. These new materials are continually providing stronger, lighter, more chemically resistant items and their use may be the most important tendency.



DISTILLATION AND ABSORPTION

by A. E. CHUTE, Foster-Wheeler Corp., New York, N. Y.

PERHAPS the most significant development in distillation practice has been the plant-scale application of extractive and azeotropic distillation to obtain relatively pure products for mixtures which would be impractical, if not impossible, to separate, using conventional techniques. Theoretical and empirical engineering studies on these new distillation techniques have produced methods for estimating and predicting performance, although the methods are tedious and perhaps somewhat inadequate, they represent a new tool for the chemical engineer.

There has been little change in industrial absorption and distillation equipment in the past two years. Fiber glass packing was introduced commercially in late 1943 and there has been a trend toward greater use of stoneware packing. Where tower diameters are greater than three or four feet, there has been a trend toward the use of perforated trays for liquid-liquid extraction and for handling materials carrying suspended solids. In the petroleum industry the advent of catalytic cracking made practical the combining of the gas absorber and stripper in one tower, and this design is being carried over to other refinery gas absorption units.

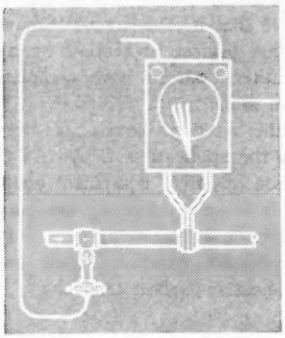
Fractionating towers in general are being built taller and with more trays, allowing more precise fractionation to produce the greater purity of products required in modern processes. By this means the increased purity is obtained for a slight increase in capital investment, and practically no increase in operating cost. At the same time towers for atmospheric and vacuum distillation are being built in larger diameters than heretofore, thereby increasing the capacity of single units.

There has been practically no change in the design of bubble caps and trays, but the trend is toward simpler layouts than were in use before the war, and more frequent use of multipass trays.

Installation of glass fiber packing in a 50 in. diameter alcohol column at the Tom Moore Distillery. Care is used in packing to insure a uniform density of 4.7 lbs. per cu. ft.

DISTILLATION AND ABSORPTION —New Equipment Developed 1944-5

Type of Equipment	*Sizes*	*Construction Materials*	*New Features*	*Applications*	*Limitations*	*Company*
Bubble cap.	3" diameter.	Copper.	Louvre design gives opposed cross flow causing vapor bubbles to collide and break up giving better contact between vapor and liquid.	.....	.....	Brighton Copper Works
HCl absorbers.	any	Pyroflex or Permanite.	Internal cooling, small size, unit capacity, new mounting and connection for cooling tubes, and integral gas scrubber makes one piece unit.	Recovery or absorption of HCl from chlorination processes.	.....	Maurice A. Knight
Fume washers.	any	Steel, wood, Pyroflex, Permanite, or Knight-ware.	New liquid distributor provides non-clogging feed and built-in, low resistance mist or droplet entrainment stop.	Fume removal.	.....	Maurice A. Knight
Flanged stoneware towers.	Up to 48"	Stoneware or porcelain.	Can operate at higher pressure and flanges reduce assembly time.	HCl absorption.	Less than 110°C.	General Ceramics and Steatite Corp.
Karbate tower.	.....	Karbate.	All Karbate construction including dephlegmating condenser and bayonet heaters.	.....	.....	National Carbon Co.



INSTRUMENTATION AND PROCESS CONTROL

by O. E. BARSTOW, Dow Chemical Co., Midland, Mich.

THE most casual observer looking over recent trends in process control instruments would probably be impressed by the swing to electronic types. Take for example the field of self-balancing potentiometers. Instruments in which deflections of the galvanometer are detected photo-electrically have been available for some time. More recently the detection of pointer-position electronically by inductive or capacitive coupling or shielding has been highly developed. For example, Wheelco offers a line of accurate and dependable indicating temperature controllers using the principle of inductive shielding for pointer-position detection. In some other instruments the galvanometer itself has been eliminated and in its place we have electronic amplification of the minute off-balance voltage obtained from the potentiometer circuit. Leeds and Northrup's Speedomax temperature recorder was the pioneer instrument of this type. Brown's electronic self-balancing potentiometer is a more recent example. This excellent electronic instrument is available in round chart style and strip chart style both single-point and multi-point at prices competitive with the older galvanometer types. The round chart model is available with pneumatic or electronic control.

Several companies now offer electronically balanced AC-bridge instruments for resistance-thermometer temperature recorders and electrolytic-conductivity recorders. In general electronically balanced potentiometer and bridge recorders give rapid, smooth and sensitive balancing action, freedom from vibration effects, and contain a minimum of moving parts.

Electronic circuits are used in glass electrode pH recorders, in many continuous thickness gauging systems and in photoelectric systems for aligning, counting, personnel protection and illumination control. They are used in electronic flame controllers, liquid level controllers, bin level indicators, moisture content recorders, speed regulators and in a host of other measurement and control applications.

Properly designed and constructed electronic equipment requires very little attention and is easily serviced. Tube failure need not be serious with properly selected tubes operated at conservative ratings.

It is interesting to note other trends. The control of electric heat to an oven or furnace need no longer be simply on-off or high-low control, but can be throttling just as in valve-controlled systems. One way to do this is with saturable-core reactors. Another way that is rapidly gaining favor is by means of the on-off-time-ratio-adjusting-type of temperature controller. In this system the electrical input varies between full-on and full-off or between a fixed high and fixed low value. The controller merely controls the ratio of on-time to off-time or the ratio of high-time to low-time. Wheelco uses this principle. So does Leeds & Northrup in its throttling electric control.

Compound control systems are being used more and more. Here the primary measuring instrument, instead of directly controlling the flow of energy or material into or from the process, changes the set-point of another instrument which actually controls the energy or material flow. Such systems are widely used on stills. In the case of pneumatic controllers such a system requires that the second instrument have a "pneumatic set" feature. The better controllers are now available with this feature.

More and more of the newer controllers are designed as an assembly of easily removable and interchangeable sub-assembly units. Taylor's Fulscope controllers and Wheelco's Universal controllers exemplify this type of construction. Such design greatly facilitates servicing, permits ready change of range and affords flexibility in choice of type of control response as well as easy addition of special features such as the "pneumatic set" feature. The possibility of easy conversion from one type to another reduces the investment in spare instruments and parts that must be carried by the user and reduces time lost waiting for factory shipments. Throttling control, automatic-reset and derivative control or any desired combination of these control re-

INSTRUMENTATION AND PROCESS CONTROL—New Equipment Developed 1944-5

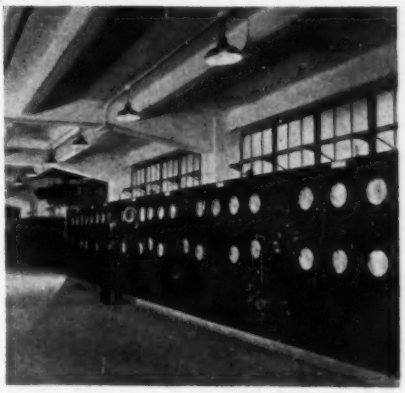
Type of Equipment	*New Features,*	*Applications*	*Company*
Electronic self-balancing potentiometer	Faster speed, improved sensitivity, responsiveness and accuracy by electronic amplification of off-balance voltage in the potentiometer circuit. Emergency alarm feature.		Brown Instrument Co.
Potentiometer controller.	Three separate load circuits can be connected singly or together to provide nine different connections for varying requirements.		Bristol Co.
Proportional current-input controller.	Rotating cam interrupts current flow for a length of time proportional to the departure of the temperature from the control point.		Bristol Co.
Electronic resistance thermometer.	Electronic unit replaces galvanometer usually used. Continuous recording of four temperatures on same chart, controlling two temperatures from same instrument between—100°F. and 1200°F.		Bailey Meter Co.
Electric heating control.	Balance method for measurement and control provides full proportional time action.		Leeds and Northrup Co.
Enclosed rotameter.	⅛-2½" cast iron, steel, bronze, and stainless steels with totally enclosed rigid construction, quick opening and disassembly, outside stuffing box, float stop.		Fischer and Porter Co.
Valve-body rotameter (Rotaline).	¼-6" cast iron, steel, bronze, and stainless steel for pressures up to 10,000 lbs. per sq. in. and 250°F.		Fischer and Porter Co.
Rotasleeve rotameter.	6-20" cast iron, steel, bronze, and stainless steels rotameter tube held between tees for handling flows up to 14,000 gpm. of water or 16,000 cfm. of air.		Fischer and Porter Co.
Flow rate controller.	Rotameter movement is utilized flow rate control or flow totalization, the latter particularly adaptable to batch dispensing systems.		Fischer and Porter Co.
Concentrate control.	Probe insert depending on resistance of liquid permits application of an electronic circuit for control purposes.		Photoswitch, Inc.
Vacuum recording gage.	Mcleod type recording gage modified to provide a continuous record of pressure from 1000-5000 microns.		F. J. Stokes Machine Co.
Smoke detector.	Sample of gas is passed between light source and "eye" which responds when the smoke reaches a predetermined density. Light source can be varied to vary point of response.		Photoswitch, Inc.
Pressure gage	New type pressure gage using electrical resistance strain gage to measure deflection of metallic element.		Baldwin-Southward Div., Baldwin Locomotive Wks.

sponses can be had on many controllers by simple adjustments or addition of necessary parts.

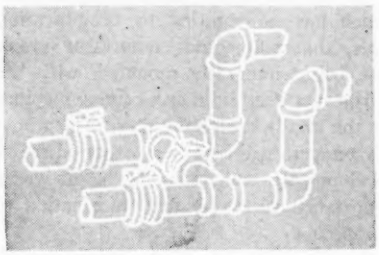
Bellows and diaphragms are being used more than ever as instrument elements in flow meters, level controllers, specific gravity controllers, and telemetering systems. Better design and the substitution of the "force-balancing" or "null-balance" principle for the "position-balance" principle practically eliminate errors due to bellows characteristic. A greater number of instruments are now using torque-tubes to eliminate special seals and stuffing boxes. Some instruments are using high capacity non-bleed pilot air valves to give rapid control-valve response with low air consumption. Pivots, links, pen-arms and other mechanical elements are more sturdy on some of the newer models.

Process control will be facilitated by some of the new instruments which now measure quantities in the plant that were formerly measured only in the laboratory. Precision Scientific Company's refractometer for flowing samples, Foxboro's "Verigraph" moisture-content recorder, and Baird Associates' continuous infrared absorption recorders are typical examples.

These remarks are intended only to indicate very briefly some of the trends in process control instruments. Many worthy advances have not been mentioned. Older types are being constantly improved; many new types are being developed. In general, today's process control instruments are more accurate and reliable, more easily serviced and more versatile than those of yesterday.



Control instruments at the Institute, W. Va., plant of Carbide and Carbon Chemicals Corp.



PIPE AND FITTINGS

OUTSTANDING in the field of pipe and fittings is the persistence and ingenuity which the makers of non-metallic materials have applied to the fabrication of improved designs and to the production of a wider range of sizes and accessories. Design improvements have increased the ruggedness and facilitated the installation of "Karbate," "Haveg," stoneware and porcelain pipe and fittings. Improved flanges and flexible couplings have been developed and new means devised for protecting fragile materials from shock and vibration. Pipe line strainers are now available in glass, porcelain and stoneware.

Flexible metal tubing has appeared in much larger sizes for use as seamless fume ducts and piping. A variety of alloys have been fabricated into flexible tubing to extend the corrosion resistance and temperature service limits. A number of corrugated or bellows-type expansion joints have been introduced for both moderate and high pressure service.

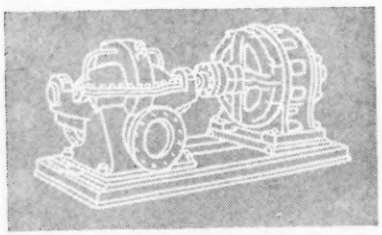
The new "Karbate" globe valve is an outstanding development in design for a non-metallic material. The "Flex-flo"

PIPE AND FITTINGS —New Equipment Developed 1944-5

Type of Equipment	*Sizes*	*Construction Materials*	*New Features*	*Applications*	*Company*
Pipe and fittings	1½" to 12" dia. in lengths up to 5'.	"Knightware" (armored)	Armored with "Permanite" plastic for greater resistance to physical and thermal shock and lighter weight.	Corrosive chemicals. Stands higher pressures than ordinary "Knightware" up to 360°F.	Maurice A. Knight
Pipe and fittings	½" to 12" dia. Lengths up to 4' in ½" and ¾" sizes, up to 10' in others.	"Haveg"	Complete range of sizes.	Resistant to most corrosive chemicals except nitric and chromic acids, H_2SO_4 over 50% conc., sodium hypochlorite, acetone, aniline, pyridine, Br, I, and chlorobenzene.	Haveg Corp.
Flexible pipe coupling	1" to 6" dia. "Karbate" pipe sizes.	"Karbate"	Flexible connector permits sufficient movement to protect "Karbate" pipe against vibration, expansion, etc.	"Karbate" pipe lines.	National Carbon Co.
Van-Stone pipe flange	1" to 10" dia. pipe sizes.	"Karbate"	Van-Stone type flange for "Karbate" pipe. vailable as nozzles, reducers, blind flanges, and slotted bolt couplers.	Karbate pipe lines and equipment connections.	National Carbon Co.
Flexible tubing	6" dia. and up.	Steel, stainless steel (all types) and other alloys.	Seamless, flexible duct, also made as flexible coupling.	Corrosion resistant duct for temps. from sub-zero to 1800°F. and pressures up to 30 p.s.i. Couplings withstand pressures to 300 p.s.i.	Zallea Bros. & Johnson
Flexible tubing	5/16" to 8½" dia.	Stainless steel	Seamless, flexible tube in large sizes.	Fume duct for high temp. and corrosive service.	Chicago Metal Hose Co.
Bellows	½"x¾" to 8½"x9".	Stainless steel	Large size flexible connection.	High temp. seals, traps, etc. for instruments.	Chicago Metal Hose Co.
Globe valve	1" and 2" sizes.	"Karbate"	All "Karbate" construction, self-lubricating stem, self-seating disc, available with steam heating adapter.	Three models: non-oxidizing, non-caustic service below 120°C.; oxidizing, but non-caustic service below 120°C.; and one most suited for caustic. All for pressures up to 50 p.s.i.	National Carbon Co.
Gate valve 300 lb. A.S.A. 600 lb. A.S.A.	½" to 12".	Alloyco 20, 18-8S, 18-8SMo, 25-12S, and 25-12Cb.	Solid or split wedge gates in 300 p.s.i. model, solid only in 600 p.s.i. Removable yoke bushings, back seating valve.	Corrosion resistant valve for high pressures. Not resistant to HF, HCl and 45 to 93% H_2SO_4 at some temps) and certain concentrations of NaCl, $CaCl_2$ and NaOH.	Alloy Steel Products Co.
Sampling valve	½" to 3½".	Alloyco 20, 18-8S and 18-8SMo.	Angle valve with renewable swivel disc.	For H_2SO_4 up to 45% conc.	Alloy Steel Products Co.
Strainer	Up to 4" pipe size.	Stoneware and porcelain.	All ceramic construction corrosion resistant.	For use in pump suction lines up to 110°C.	General Ceramics & Steatite Corp.
Strainer	1", 1½" and 2" sizes.	"Pyrex" glass.	All glass construction corrosion resistence and visibility.	For pipe line pump suction service.	Corning Glass Works

constricted annulus type valve is a novel design with many interesting features such as simple remote control and a very minimum of moving parts.

The introduction of new plastic and elastic compositions is continually enlarging the range of packings and gaskets available. New synthetic lubricants such as the silicones offer improved operation and extended applications for lubricated cocks and valves, particularly in the direction of higher temperature service.



PUMPS AND COMPRESSORS

ENGINEERING efforts during the wartime expansion of process industries in general, and the inception of the atomic energy program in particular, have brought new developments in pumps, compressors, and blowers. These developments embody radically new designs, design improvements to the old types of equipment and a broad extension of process applications.

The few details released on the Manhattan projects hint at great progress in the design of pumps for handling extremely corrosive materials. Here much of the work has been centered around the perfection of new types of stuffing boxes and packing glands. Because of security regulations, details of these new developments have not yet been released. However, a recent War Department approved press announcement may indicate the nature of some of these radical new developments. "Thousands of pumps operating under reduced pressure at Oak Ridge created problems in vacuum technique on an unheard of scale. Other thousands operated at nominal pressures. But regardless of the type of service, none could leak or corrode and all had to have as small a volume as possible. Many different types of centrifugal blower pumps and sylphon-sealed reciprocating pumps were tried out and new types developed. For example, in one of the pumps for the larger stages the impeller was driven through a coupling containing a very novel and ingenious new seal. Another type of pump was completely enclosed, its centrifugal impeller and rotor being run from the outside by induction. Perhaps the most significant advance in pumps design which has been most successfully accomplished is the utilization of supersonic velocities of a very high order (Mach numbers of over 1.0)."

In the field of reciprocating compressors there has been a trend toward extending sizes to both larger and smaller units. Very large reciprocating machines have been employed in multi-stage application for handling enormous capacities at high overall compression ratios. In at least one process big reciprocating machines have been applied to high-pressure, booster service in a gas recycle line. Many smaller compressors have been developed to meet rigid space and weight requirements for use in combat areas. Designed for multi-stage operation and high piston speeds, these small machines have achieved a degree of compactness previously unknown. The use of piston speeds approaching the range once reserved for airplane engines tends to make maintenance costs higher than those expected for the older slow speed machines.

Refrigeration equipment has also benefited from the general trend to high speed, compact machines. In particular multi-cylinder radial compressors have been widely applied in installations of moderate capacity. At least one manufacturer has come out with a refrigeration compressor which has no rotating or reciprocating seals, the motor and compressor crank case being integrally mounted, with the refrigerant itself used as a cooling medium for the totally enclosed motor. The whole low temperature field has witnessed many developments which should be of great importance when detailed information is released.

Positive displacement compressors, based on the Lysholm design, have recently been announced for service at high compression ratios and large suction volumes. In view of the close clearances required for high efficiency in this type of machine, the service record of this new development will be watched with great interest by the process industries.

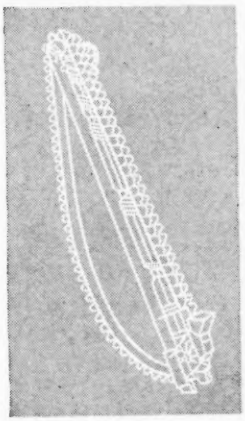
Centrifugal compressors, large and small, continue to serve long and well in the handling of large quantities of gas at modest pressure differentials. There has been an increasing number of blower applications in the higher temperature

PUMPS, COMPRESSORS, AND BLOWERS—New Equipment Developed 1944-5

Type of Equipment	*Sizes*	*Construction Materials*	*New Features*	*Applications*	*Company*
Gas compressor double helical Lysholm design.	12,500 c.f.m. at 2 or 3 to 1 compression ratio.	.....	Positive displacement compressor with volumetric efficiency approaching 100% adiabatic efficiency approaching 80 to 85%.	Currently applied only to a gas turbine power unit.	Elliott Co.
Centrifugal pump.	50 to 220 g.p.m. at 20 to 100 ft. head.	"Karbate"	All "Karbate" construction for corrosion and thermal shock resistance. Has no stuffing box, but uses mechanical seal.	Pumping most corrosive chemicals.	National Carbon Co.
Centrifugal pump, self-priming.	1½" to 6" discharge.	Iron.	Seal tank with automatic bypass valve for priming.	General service.	Allis-Chalmers Co.
Centrifugal pump.	Up to 750 g.p.m. and 450 ft. head.	Iron-steel-bronze and stainless steel.	Sliding features for high temp. water cooled stuffing box and bearings.	Pumping hydrocarbons and chemicals up to 500 p.s.i. and 800° F.	Warren Steam Pump Co.
External gear screw pump.	1½" to 16" discharge.	Any machinable metal.	Improved design with gear and bearing heads bracketed to pump ends. In standard and hopper types with or without steam jacket.	Hopper type for materials that hardly flow, standard type for viscous or hot liquids. Serves up to 500° F.	H. K. Porter Co.
Rotary positive displacement.	¼ to 8 g.p.m.	Iron, bronze, stainless steel, nickel alloy, Hastelloy.	Small capacity, high-head pump close coupled to motor. Has mechanical seal.	Handles water up to 500 p.s.i. and oil or viscous liquids to 1000 p.s.i.	Bump Pump Co.
Rotary pump for butane.	35, 50 and 90 g.p.m.	All iron, bronze fitted.	Glycerine reservoir around stuffing box acts as lubricant and seal.	Pumping propane and butane to 300 p.s.i.	Blackmer Pump Co.
Diaphragm pump.	8 to 90 g.p.m.	Any metal and rubber covered iron.	Pumps thick materials that tend to build up on pump parts—avoids agitation and aeration.	Rubber latex and similar materials.	T. Shriver & Co.
High vacuum diffusion pump.	2500 c.f.m. free air from 0.01 to 0.1 microns to back-pressures of 500 microns. 8" outlet.	.....	High speed pumping, automatically controlled electric boiler heat, rapid cooling.	High vacuum.	National Research Corp.
High vacuum pump.	100 c.f.m. displacement @ 350 r.p.m.	.....	Produces vacuum of 5 microns in continuous service, can handle liquid slugs without injury.	High vacuum.	F. J. Stokes Machine Co.

ranges (500 to 600° C). The gas turbine-axial flow compressor combination has been successfully applied to the recovery of power from hot, high pressure flue gases. In one petroleum process the power recovered in this way is more than enough to compress all the air supplied to the combustion unit which produces the flue gas. This kind of installation should be very valuable in processes which are favored by increased pressure but which cannot sustain large power costs for compression. There has also been a widespread increase in the use of centrifugal refrigeration equipment especially in the range of large capacities and low suction pressures.

In conclusion it may be stated that the field of gas and liquid pumps has experienced many valuable technical advances during the war years. When made generally available, these innovations will greatly improve the operations of the chemical industry. However, the rapid commercialization of these results to meet guaranteed specifications will probably require the impact of vigorous customer demands upon equipment makers who are traditionally—and wisely—conservative in marketing new lines of equipment.



MATERIALS HANDLING

IN the war years greatly increased production, and shortages of manpower, brought a marked increase in the application of materials handling equipment. While the employment of materials handling equipment has been extensive, basic advances in equipment design have been fewer or non-existent. The improvements that have been made are minor changes in the design of conventional equipment types to adapt them to many specialized installations.

In the handling of bulk materials there seems to be a general trend toward the use of continuous conveyor systems for loading, unloading, and transporting between process steps based on the principle of keeping material moving to minimize difficulties with stoppages and to reduce the quantity of material "in process." Coupled with the increasing use of continuous conveyor systems is a growing use of continuous and automatic weighing devices and mechanical packing equipment.

Since the type of equipment used for handling bulk materials is determined largely by the physical characteristics of the material, it is interesting that new systems have been devised for handling as many as four materials having widely different properties (ranging from oyster shells to caking powders) using a single conveyor system. Installations of this type exemplify a trend toward completely engineered materials handling systems designed for specific plant conditions. There has been a marked increase in the use of both the "Redler" or "Uni-Flo" type, and the pneumatic type conveyor systems which provide both horizontal and vertical movement in a single compact unit.

In the handling of packaged materials, the industrial truck (both electric and gasoline types) has seen greatly increased application. The fork-type lift-truck for pallet handling has become particularly important to chemical plants and warehouses. New developments in industrial trucks have been hampered by wartime restrictions limiting production to a few standard models. However, with these restrictions now lifted, there should be a trend toward modified designs adapted to many specialized problems. A new articulated fork lift-truck, which was introduced just before the war, should again appear, for the very short turning radius of this truck permits the use of relatively narrow warehouse aisles.

There have been many new materials handling devices of the manual type introduced on the market, but few if any represent radically new developments. It is

MATERIALS HANDLING—New Equipment Developed 1944-5

Type of Equipment	*Sizes*	*New Features*	*Applications*	*Company*
Box car loader.	.....	Swivel joint allows unit to be swung into box car and be directed to any part of car. Dust tight up to point of discharge.	Loading and trimming box cars with loose, granular materials.	Stephens-Adamson Mfg. Co.
"Uni-flo" conveyor.	2 to 130 tons per hour.	Pipe-line type conveyor using scraper-carrier; combines horizontal and vertical movement in same conveyor.	Handling free - flowing, dusty, fine or granular materials.	Chain Belt Co.
Portable belt conveyor.	14" wide belt 11' long.	Adjustable from horizontal to 30° angle and from 18" to 42" in level height; built-in motor drive.	Transporting bags, boxes, carton, etc.	Standard Conveyor Co.
Portable belt piler.	14" and 24" belts stacking height 3' to 10'.	Adjustable to give combined horizontal and inclined belt positions for stacking.	Piling bags, boxes, cartons, etc.	Standard Conveyor Co.
Bucket conveyor.	.....	"Side car" conveyor occupies a minimum head-room, handles frangible materials without degradation, and is self-feeding and self-discharging at any number of points.	Handling magnesium pellets.	Link-Belt Co.
Weight-printing scales.	.....	Prints weight on thick tickets, strip records or combinations of these; can be adapted to current forms.	Batch weighing.	Toledo Scale Co.
Lift truck.	2,000 to 10,000 lbs. capacity.	Gasoline powered with hydraulic lifting device; seated center control, front wheel drive.	Transporting and stacking materials in warehouses.	Towmotor Corp.
Tractor.	3,000 to 4,000 lbs. drawbar pull.	Two speeds foreward and two reverse; handles normal load in narrow aisle and on steep ramps.	Towing industrial trailers.	Towmotor Corp.
Barrel lift.	55 gal. drum size.	Automatic safety lock on handle, adjustable for various weights.	Raising, moving and tilting 55 gal. drums.	Falstrom Co.
Drum hoist.	55 gal. drum size.	Saddle rig for drum.	Raising and emptying drums into high tanks.	Falstrom Co.
Clamp for drum or barrel hoist.	.....	Two styles; one for horizontal and one for vertical position of drum.	Hoisting drums.	Never-Slip Safety Clamp Co.

of interest to note that one of the aircraft companies is currently planning to produce manual trucks constructed of light weight alloys.

The users of materials handling equipment are becoming increasingly cognizant of the great economy and simplification obtainable with properly applied equipment for handling both bulk and packaged materials. Perhaps this is the most significant trend in the whole field of materials handling.

COMPANIES WHOSE NEW EQUIPMENT IS DESCRIBED IN "PROCESS EQUIPMENT DEVELOPMENTS"

Adams Co., Inc., R. P.
59 Chicago St.
Buffalo, N. Y.

Allis-Chalmers Manufacturing Co.
Milwaukee 1, Wis.

Alloy Steel Products Co., Inc.
1350 W. Elizabeth Ave.
Linden, N. Y.

Aluminum Company of America
2103 Gulf Bldg.
Pittsburgh 19, Pa.

American Air Filter Co., Inc.
190 Central Ave.
Louisville 8, Ky.

American La France Foamite Corp.
Elmira, N. Y.

American Machine and Metals, Inc.
(Tolhurst Centrifugals Div.)
East Moline, Ill.

American Pulverizer Co.
1549 Macklind Ave.
St. Louis, Mo.

Ansul Chemical Co.
Marinette, Wis.

Bailey Meter Co.
1048 Ivanhoe Rd.
Cleveland, Ohio

Baldwin Locomotive Wks., The
Baldwin-Southwark Div.
Chester, Pa.

Barnstead Still & Sterilizer Co., Inc.
29 Lanesville Tr.
Boston 31, Mass.

Blackmer Pump Co.
1902 Century Ave.
Grand Rapids 9, Mich.

Bridgeport Brass Co.
Bridgeport, Conn.

Brighton Copper Wks.
Brighton Station
Cincinnati 14, Ohio

Bristol Company, The
119 Bristol Rd.
Waterbury 91, Conn.

Brown Instrument Co., The
4493 Wayne Ave.
Phila. 44, Pa.

Bump Pump Co., The
LaCrosse, Wis.

Chain Belt Co.
1697 W. Bruce St.
Milwaukee 4, Wis.

Chicago Metal Hose Corp.
1317 S. Third Ave.
Maywood, Ill.

Corning Glass Wks.
Corning, N. Y.

DeLaval Separator Co., The
165 Broadway
New York 6, N. Y.

Denver Equipment Co.
P. O. Box 5268
Denver 17, Colo.

Dorr Company, The
570 Lexington Ave.
New York 22, N. Y.

Downingtown Iron Wks.,
Downingtown, Pa.

Dust Filter Co.
4418 N. Clark St.
Chicago, Ill.

Eclipse Fuel Engineering Co.
751 S. Main St.
Rockford, Ill.

Eimco Corp., The
Salt Lake City 8, Utah

Elliot Company
Jeanette, Pa.

Engineering Laboratories, Inc.
Tulsa, Okla.

Enzinger Union Corp.
Angola, N. Y.

Falstrom Company
Passaic, N. J.

Fischer & Porter Co.
Hatboro, Pa.

Foxboro Company, The
Foxboro, Mass.

General American Transportation Corp.
513d Graybar Bldg.
New York 17, N. Y.

General Ceramics & Steatite Corp.
Keasbey, N. Y.

General Electric Co.
Schenectady, N. Y.

Great Western Mfg. Co.
Leavenworth, Kan.

Griscom-Russell Co., The
285 Madison Ave.
New York 17, N. Y.

Hardinge Company, Inc.
York, Pa.

Haveg Corp.
Newark 5, Del.

Horman & Co., F. R.
127 Boerum Pl.
Brooklyn, N. Y.

Ideal Commutator Dresser Co.
1006 Park Ave.
Sycamore Ill.

Illinois Water Treatment Co.
Rockford, Ill.

International Ore Corp.
500 5th Ave.
New York 18, N. Y.

Knight, Maurice A.
Akron 9, Ohio

Leeds & Northrup Co.
4915 Stenton Ave.
Phila. 44, Pa.

Link-Belt Co.
2410 W. 18th St.
Chicago, Ill.

Lukens Steel Co.
266 Lukens Bldg.
Coatesville, Pa.

Lumenite Electronic Co.
407 S. Dearborn St.
Chicago 5, Ill.

National Carbon Co., Inc.
30 E. 42nd St.
New York 17, N. Y.

National Research Corp.
100 Brookline Ave.
Boston 15, Mass.

Never Slip Safety Clamp Co.
Huguenot & River Sts.
New Rochelle, N. Y.

Niagara Filter Corp.
3080 Main St.
Buffalo 14, N. Y.

Pfaudler Company, The
Rochester 4, N. Y.

Photoswitch, Inc.
3 Chestnut St.
Cambridge, Mass.

Porter Company, Inc., H. K.
Pittsburgh 22, Pa.

Pulverizing Machinery Co.
85 Chatham Rd.
Summit, N. J.

Radio Receptor Co., Inc.
251 W. 19th St.
New York 11, N. Y.

Schneible Co., Claude B.
2831 25th St.,
Detroit 16, Mich.

Shriver & Company, Inc., T.
854 Hamilton St.
Harrison, N. J.

Sparkler Mfg. Co.
266 Lake St.
Mundelein, Ill.

Standard Conveyor Co.
North St. Paul 9, Minn.

Stephens-Adamson Mfg. Co.
63 Ridgeway Ave.
Aurora, Ill.

Stokes Machine Co., F. J.
5910 Tabor Rd.
Phila. 20, Pa.

Swanson Evaporator Co.
15649 Lathrop Ave.
Harvey, Ill.

Toledo Scale Co.
1010 Telegraph Rd.
Toledo 12, Ohio

Towmotor Corp.
1226 E. 152nd St.
Cleveland 10, Ohio

Warren Steam Pump Co.
Warren, Mass.

Welsh Mfg. Co.
Troy St.
Providence 9, R. I.

Western Precipitation Corp.
1008 W. Ninth St.
Los Angeles, Calif.

Wheelco Instrument Co.
851 W. Harrison St.
Chicago 7, Ill.

Whiting Corp.
15649 Lathrop Ave.
Harvey, Ill.

Zallea Brothers & Johnson
Ninth & Locust Sts.
Wilmington 99, Del.

HEADLINERS in the NEWS

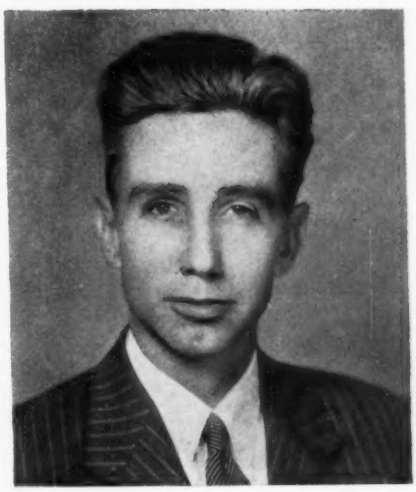
BENJAMIN M. MAY succeeds Leonard A. Yerkes, who recently retired, as general manager of the Du Pont rayon department. He has been with the organization since 1903.

J. R. FRORER, formerly manager of the Polyalcohol division, Atlas Powder Co., has been chosen manager of the industrial chemicals department, succeeding M. J. Creighton.

FRANCIS C. FRARY, director of research of Aluminum Company of America, has been elected to receive the Perkin Medal, awarded by the Society of Chemical Industry.

CARL W. PRIESING has been named general sales manager for the Ansco division of General Aniline and Film Corp. He was formerly president of the Wahl-Eversharp Company.

JOSEPH ROSIN, vice-president and chemical director of Merck & Co., Inc., Rahway, N. J., will receive the Remington Medal from the American Pharmaceutical Association.

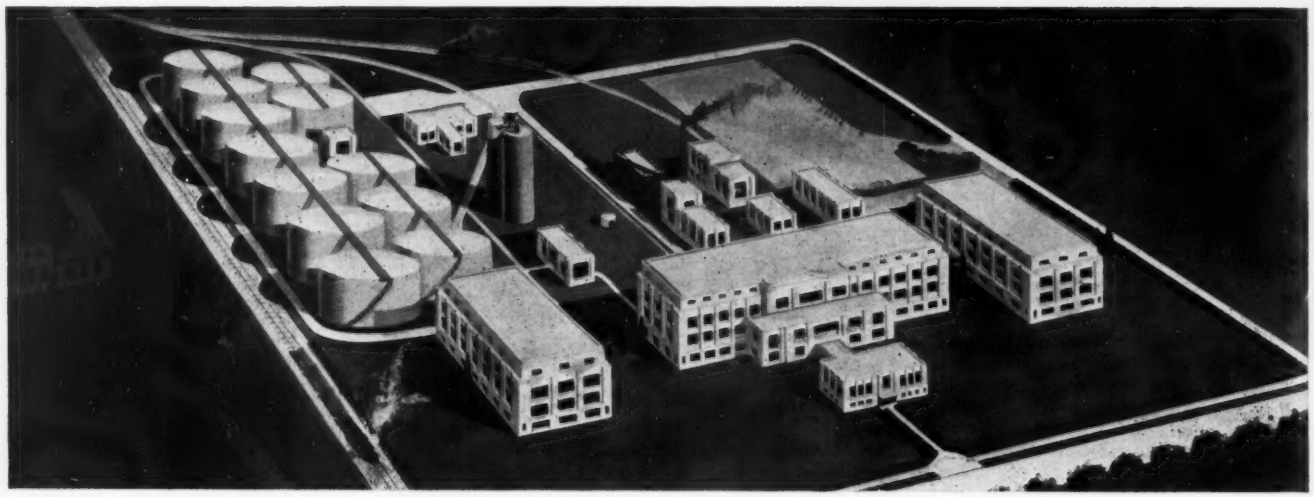


C. A. STOKES, assistant professor of chemical engineering at Massachusetts Institute of Technology, has been named head of research and development for Godfrey L. Cabot, Inc.

M. H. ARVESON, senior technologist, Standard Oil Co. of Indiana, follows Robert E. Zinn, Victor Chemical Works, as chairman of the Chicago section of A. C. S.

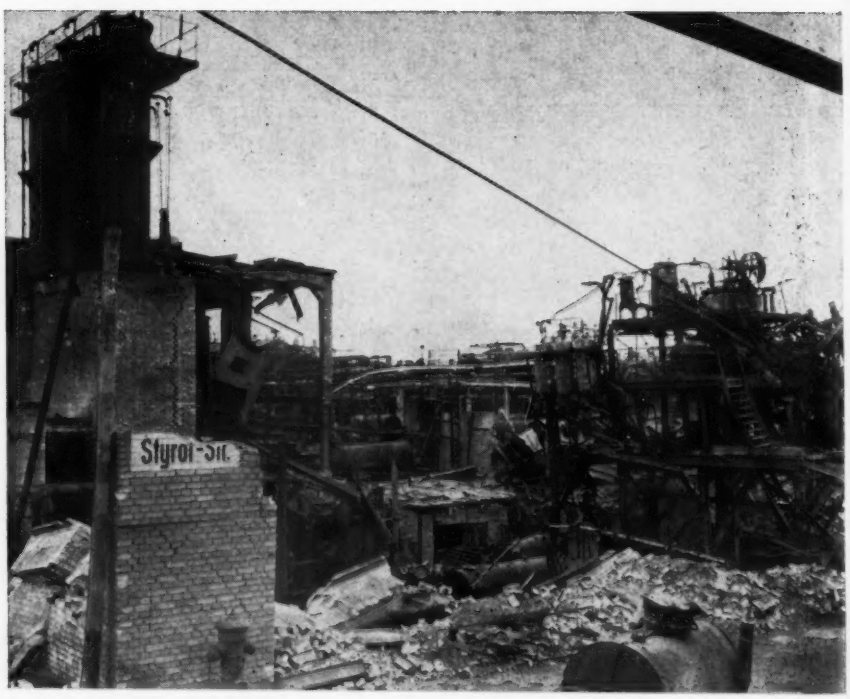
BRACEBRIDGE H. YOUNG, secretary of U. S. Industrial Chemicals, Inc., New York, has been elected vice-president and secretary of the company.

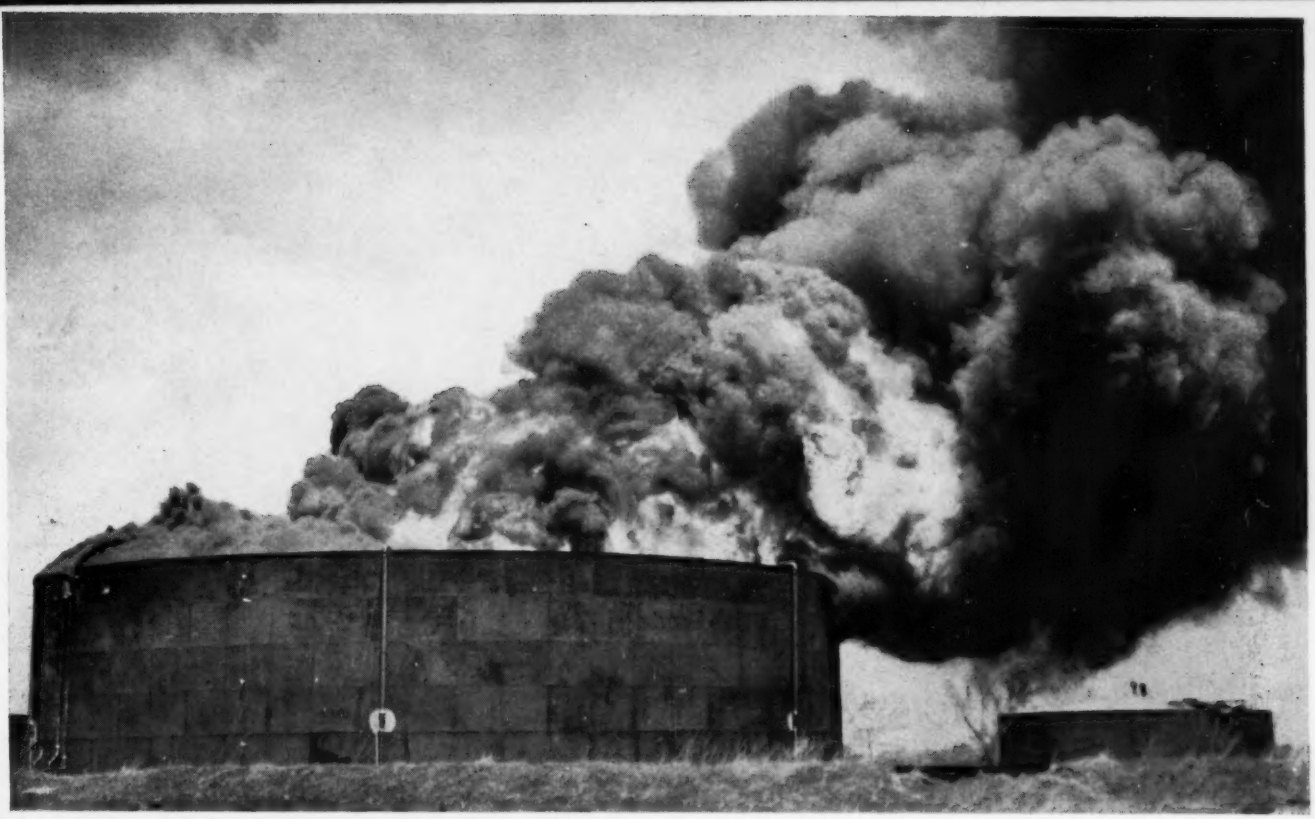
New Buildings . . .

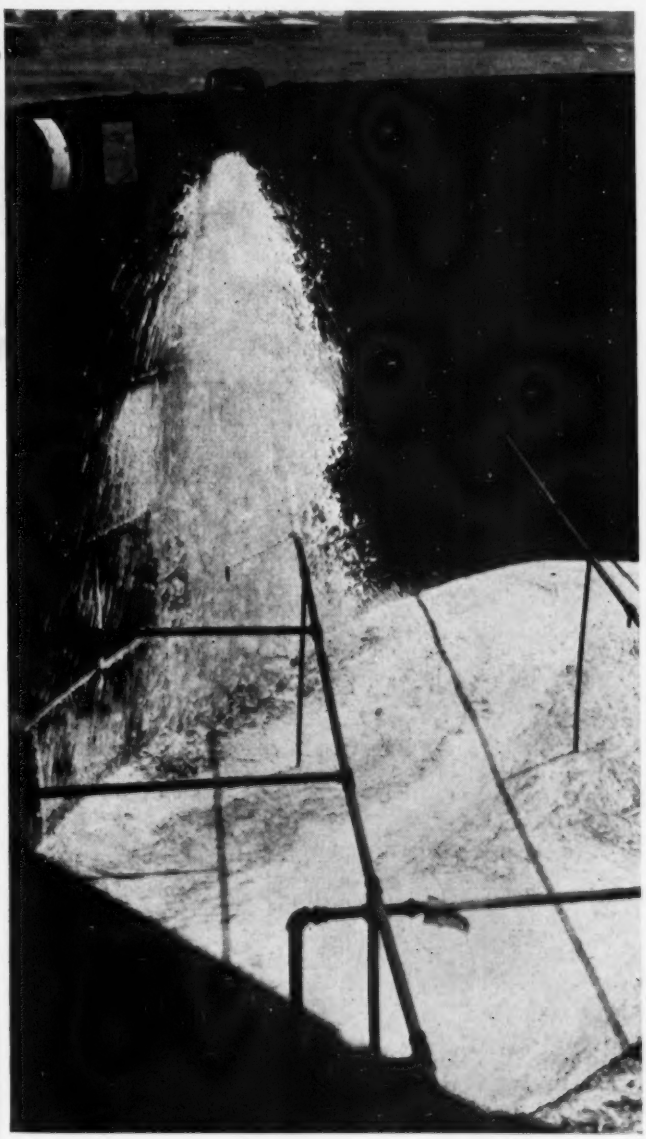


. . . and Old

Shown above are plans for two new units which are part of America's expanding chemical industry. Top picture shows the architect's drawing of research laboratories, costing more than $2,000,000, to be built at Rensselaer, N. Y., for the Winthrop Chemical Co., Inc. In the center is a sketch of a $2,500,000 project planned by International Minerals & Chemical Corp. The new plant, which will be located at San Jose, California, will be the country's largest amino products manufacturing unit, and will double International's output. Below, right, are ruins. This picture was taken at the site of a German chemical plant, after allied bombings had devastated the area.

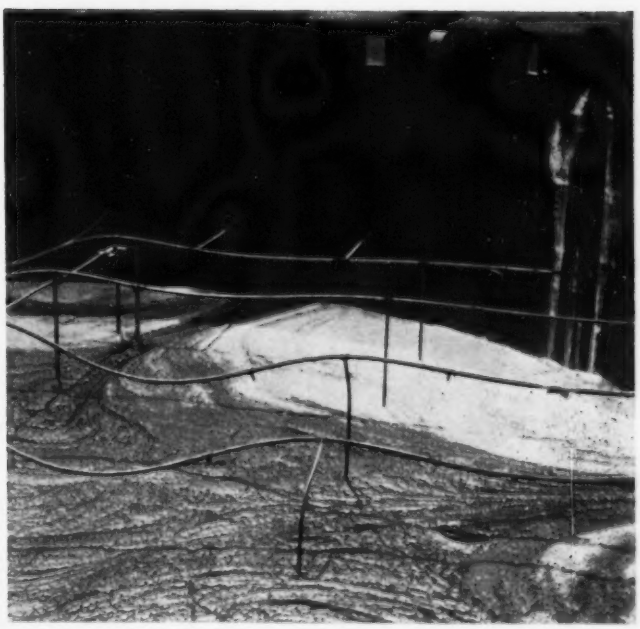






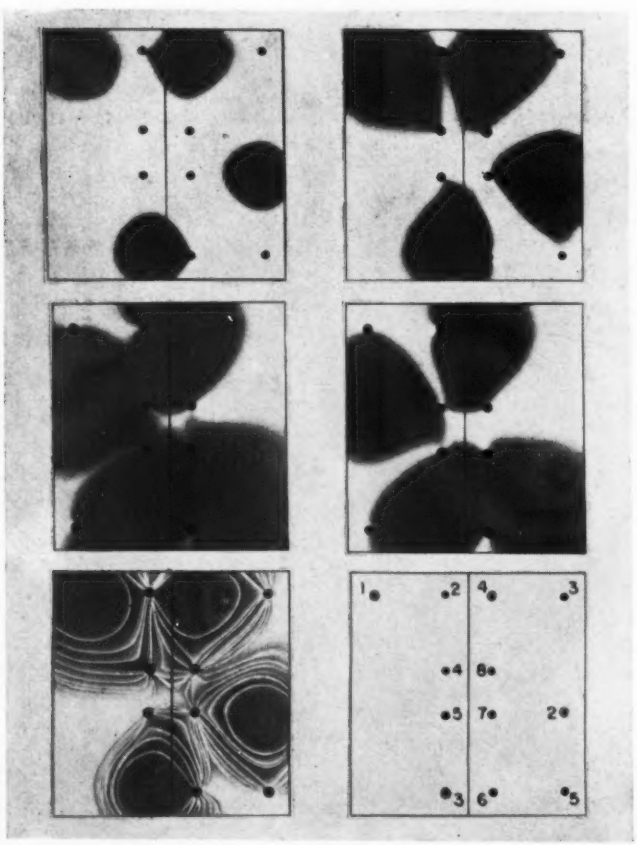
Fire Fighting Test

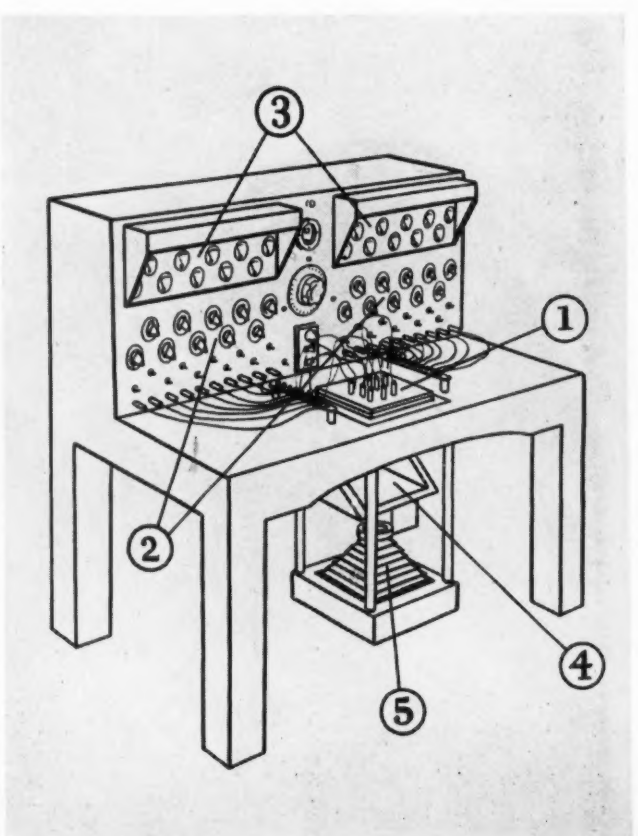
A test of the effectiveness of newly developed fire fighting equipment was demonstrated recently at Moorhead tank farm of the Standard Oil Company of Ohio, near Findlay, Ohio. This was the largest test fire ever extinguished. It was set in a tank, 93 feet in diameter, of crude oil, see above. Temperature rose higher than 2,000° F. Shown at left is the air foam developed by the Pyrene Development Corp., Newark, N. J., pouring from one of the applicators down the side of the tank shell. In the bottom picture a layer of air foam several inches thick completely blankets the crude oil. Used in proportions of one part of foam compound to approximately 20 parts of water, the mixture produces about 320 gallons of foam per gallon of compound. It was discharged into the tank at the rate of about 15,000 gallons per minute.



Model Oil Field

The electrically-operated miniature oil field, photographed at right, will save immense quantities of oil, according to the Gulf Oil Corp., perfecter of the new device. Duplicating actual oil field operations on a laboratory scale, the model can foretell results of various production methods in given fields up to 20 years in the future. The inventor, H. G. Botset, physicist in the corporation's research laboratories, is seen planning production, while his assistant holds a tray of miniature "oil wells". The model, which can measure by electric current how water and gas injection operations will work out in particular fields, contains small plastic tubes, or "wells" with hollow tips which pierce a sensitized mat made of gelatin. The tubes representing output wells are filled with colorless liquid. Those representing input wells, contain blue liquid. Current is fed through the intake wells into the mat, turning the gelatin blue as far as it penetrates. A color pattern is thereby formed of the flow showing how dry gas will force wet gas or water will force oil, toward the producing wells. Below, right, is a sketch of the model. Identified by the number 1 are the plastic tubes representing input and output wells. Number 2 are the control knobs which adjust the flow for each well. The flow is measured by the dials, number 3. Beneath the wells a tilted mirror, number 4, enables the operator to view the progress of the flow pattern, while a camera, number 5, records the flow in pictures. Pictured directly below, in the first four photographs, we see the progressive spread of water from injection wells toward the producing wells, represented by black dots. The left bottom photo tells the same story in one composite picture of the various stages of flooding. Bottom right shows how the field appeared before the laboratory flooding operation began.





MONSANTO'S THIOUREA

an intermediate that can be used in a variety of products

Thiourea, also known as thiocarbamide, sulfocarbamide and sulfourea, is a versatile chemical. It is used as an intermediate in resin compositions, pharmaceuticals and in the synthesis of thioglycolic acid. It is suggested as an additive in the production of glues to prevent gelling. Thiourea may also find application in dyes and fungicidal compositions.

Your own experimentation may uncover new uses for Thiourea. For a sample and technical data, please contact the nearest Monsanto office or write: MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Mo.
District Offices: New York, Chicago, Boston, Detroit, Charlotte, Birmingham, Los Angeles, San Francisco, Seattle, Montreal, Toronto.

THIOUREA

$NH_2CS.NH_2$ Mol. Wt. 76.12

Standard Form: Crystals

Specifications: White, free-flowing crystals; moisture 0.50% max.; ash 0.05% max.; solution (10% water at 25°C) turbid

SOME OF THE MORE IMPORTANT MONSANTO INTERMEDIATES

Benzenesulfonic Acid 70-71%
Benzyl Chloride
Cyclohexylamine
2:5 Dichloraniline
Dichlorphenol and other Chlorphenols
Dicyclohexylamine
Dinitrochlorbenzene and other Nitrochlorbenzenes
Ortho-Aminobiphenyl Tech.
Orthochloranilines and other Chloranilines
Orthonitraniline and other Nitranilines
Phenol
Phosphorus Oxychloride
Phosphorus Trichloride
Salicylic Acid Tech.
Toluenesulfonic Acid 94%

MONSANTO CHEMICALS
SERVING INDUSTRY...WHICH SERVES MANKIND

NEW PRODUCTS & PROCESSES

Cellulose Propionate Plastic NP 191

PRODUCTION of propionic acid on a commercial scale from natural gas at Celanese Corporation's Bishop, Texas, plant has made possible the exploitation of cellulose propionate as a basic plastic material. Combined with suitable plasticizers, it yields a plastic which has been introduced to the trade as Forticel.

Converted into products by injection or extrusion molding, the plastic is said to possess an unusual surface lustre and brilliant mold finish without recourse to mechanical polishing, said Technical Director Bjorn Anderson upon its introduction. In some instances, moreover, shortening of the molding time is equivalent to a 25 per cent production increase. Its superior plastic flow insures virtually invisible weld lines, and tests show that Forticel has greater weld strength than any of the present cellulose esters. The new plastic is odorless, and articles fabricated from it can be printed and lacquered without fear of tackiness.

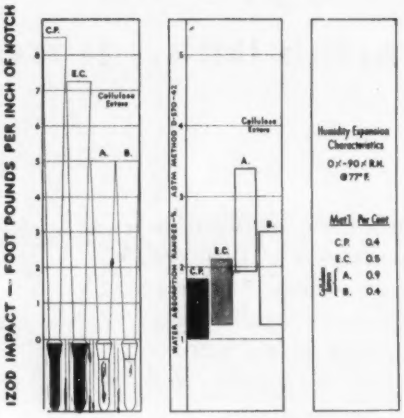
Forticel has a specific gravity of 1.2, giving a volume per unit weight 1.08 times that of cellulose acetate.

It is also characterized by an impact strength exceeding other cellulose esters, a full range of colorability, excellent electrical properties, and low moisture absorption. It is compatible with cellulose butyrate but not with the acetate or ethyl cellulose.

Forticel is now produced in a pilot plant at Newark, N. J. Large-scale production will not be reached until 1947, but it is anticipated that next year it will be produced in an amount equivalent to 10 per cent of Celanese's present production of cellulose molding powders.

Its price will probably be greater than the 37 cents per pound quoted for cellulose acetate molding powders. The difference will be made up by Forticel's lower specific gravity, however, so that the price on a volume basis will be about the same.

COMPARATIVE CHARACTERISTICS OF FORTICEL WITH OTHER CELLULOSIC PLASTICS



Moss Extracts by New Process NP 192

A process employed by the Dominion Packaging Co., Ltd., Terrebonne, P. Q., and developed by the National Research Council, embodies rapid hot water extraction of the jelling substance from Irish moss, charcoal purification, and freezing. The ice and extract layers can then be readily separated and the latter air-dried and ground. The procedure is basically less expensive than the ordinary spray-drying, drum-drying, or tunnel-drying commercial methods.

Incidentally, the addition of 0.2 per cent potassium chloride to the gel composition yielded jellies stronger than those from agar, with no discernible difference in taste.

Florida Limerock DDT Diluent NP 193

Work at the University of Florida Engineering and Industrial Experiment Station has shown that finely ground Florida limerock can be used as an insecticide carrier or diluent dust. Tests made with this new dust and DDT have shown that the limerock is completely inert toward DDT. The DDT is not decomposed by the limerock even when they are heated together in the presence of water vapor at 100° C for several days.

There are large deposits of this soft variety of limestone in Florida and it is thought that this dusting powder will be widely used. The finely ground limerock is air floated to eliminate grit and coarse particles from the finished product. Samples of the insecticide diluent for use with DDT and other insecticides is obtainable from the University of Florida Engineering and Industrial Experiment Station, Gainesville, Florida.

Cellulose From The Common Reed NP 194

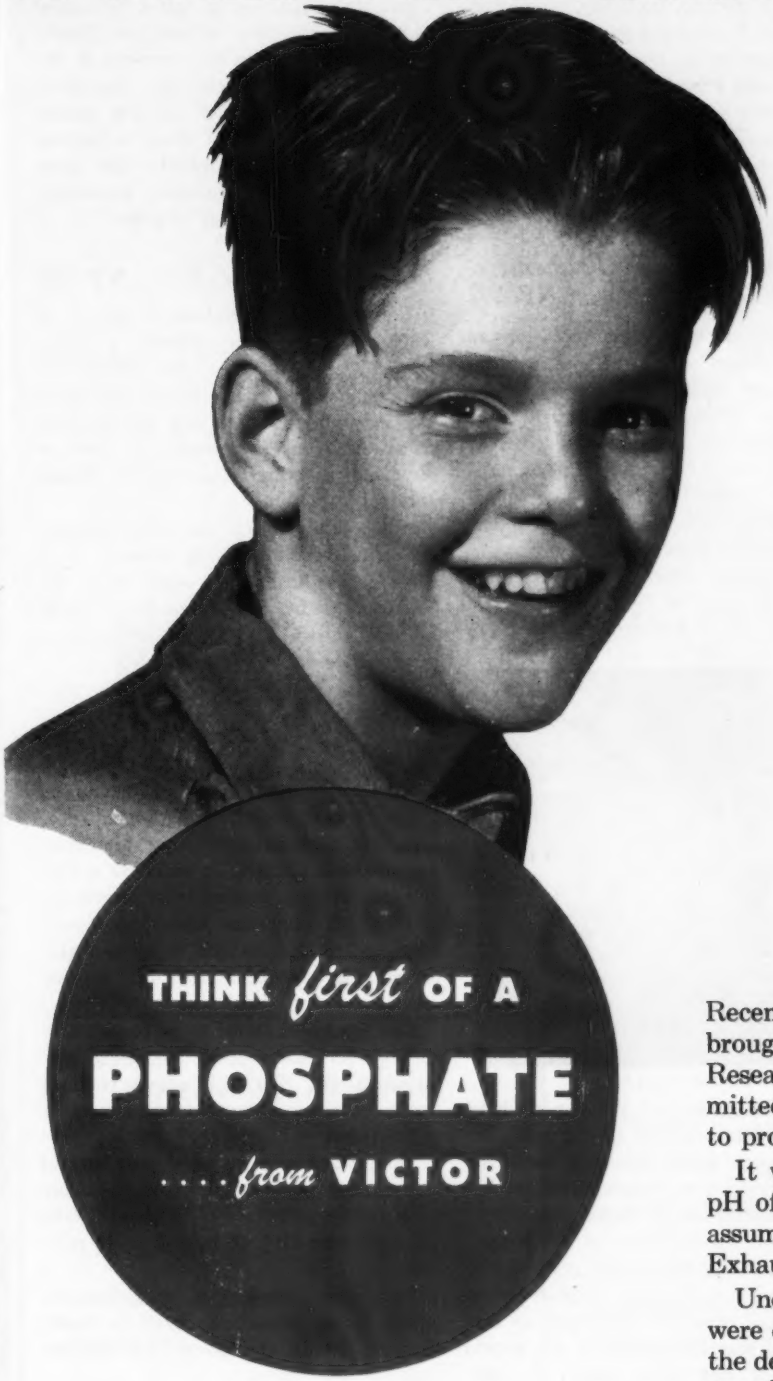
In the countries of the Mediterranean Basin, the common reed (*Arunds Donax*) has shown itself to be most adapted to yield in the shortest time possible cellulose of an abundant and excellent quality.

All the studies of the Snia Viscosa up to 1936 were directed on this plant, and in 1938 the Society, with the cultivations and the establishments of Torre di Zuino (Udine), has solved the problem from the industrial as well as the agricultural point of view. With an agricultural establishment of 15,000 acres only in part drained) and with its imposing industrial works, the Snia Viscosa could have arrived at a production (if the war had not arrested its accomplishment) of more than 65,000 tons of cellulose a year.

The common reed is an annual plant with a hard stem and is cultivated in Mediterranean Europe, North Africa, Syria, Transcaucasia, and America.

In the United States the reed is found in the Southern states and on the Pacific Coast, and is utilized for the production of musical instruments.

The common reed, under favorable cli-



THINK *first* OF A

PHOSPHATE

. . . . *from* VICTOR

HOW A VICTOR PHOSPHATE SOLVED A COLOR PROBLEM...

Recently, the manufacturer of a food product brought a very interesting problem to the Victor Research Laboratory. According to reports submitted, the product, when added to liquid, failed to produce the exact color desired.

It was suggested that a detailed study of the pH of the mixture be made, the pH having been assumed to be the controlling factor for color. Exhaustive tests disproved this assumption.

Unexpectedly, certain phosphorus compounds were discovered to be quite effective in producing the desired color in the mixture. One in particular was found by a group of competent judges not only to develop the exact color desired, but to produce a more creamy product with better body and improved flavor as well.

Yes, many product problems have been solved by the Victor Research Laboratory by discovering new and unusual applications of phosphorus compounds. For that reason, whenever you are confronted with a product problem it pays to *think first of a phosphate from Victor!* Our laboratory is at your service.

PARTIAL LIST OF VICTOR CHEMICALS

Acids . . . formic, metaphosphoric, oxalic, phosphoric, polyphosphoric.

Formates . . . aluminum, sodium, sodium boro-.

Metaphosphates . . . aluminum, ethyl.

Orthophosphates . . . ammonium, calcium, iron, magnesium, potassium, sodium.

Oxalates . . . calcium, sodium.

Phosphorus (yellow).

Ferrophosphorus

Phosphorus Compounds . . . chlorides, pentoxide.

Pyrophosphates . . . calcium, sodium acid, sodium iron, tetrapotassium, tetrasodium.

Sulphates . . . magnesium, sodium aluminum.

VICTOR CHEMICAL WORKS

HEADQUARTERS FOR PHOSPHATES • FORMATES • OXALATES

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NEW YORK, N. Y.; KANSAS CITY, MO.; ST. LOUIS, MO.; NASHVILLE, TENN.; GREENSBORO, N. C. PLANTS: NASHVILLE, TENN.; MT. PLEASANT, TENN.; CHICAGO HEIGHTS, ILL.

matic conditions, yields 175,000 lbs. a year of green reed from 2½ acres of cane field. After drying the weight is reduced by half and the material is transformed into 25,000 lbs. of cellulose. The same area of land would not give more than 2500 lbs. of hemp, 1100 lbs. of flax, or about 450 lbs. of cotton, and consequently there can be no doubt of the great utility of the reed in comparison with other textile plants.

It is claimed that the quality of the cellulose obtained presents more advantages than the cellulose of the fir tree. With regard to the quantity of s-cellulose, it is 95% against 87%; and that of the hemicellulose is respectively 3% and 13%.

Also all the other elements—the quantity of ashes, the residue of copper, etc.—of the reed cellulose are superior to that of the fir. Moreover the best proof was obtained when the first textile fibres were manufactured with reed cellulose, and it was noticed that the quality was very high.

Silicone Varnish NP 195

Because of its low curing temperature (300° F.), Dow Corning's new silicone varnish, DC 996, enables all types of electrical shops to realize the advantages of silicone insulation. Among those advantages are greater protection against failure due to sustained overloads; greatly increased service life of electrical insulation; higher permissible operating and ambient temperatures; increased protection against excessive moisture even after prolonged exposure to elevated temperatures; the elimination of fire hazards resulting from the failure of conventional electrical insulation; and increased power output per unit weight.

Electrical equipment wound with silicone insulating materials and sealed by impregnating with DC 996 will have the high order of thermal stability and the retention of waterproofness characteristic of silicone insulation. DC 996 can be cured at temperatures obtainable in ovens now used for curing organic varnishes.

Another advantage of this new silicone varnish is that electrical equipment can be baked fully assembled without damaging the commutators or the slip rings. The temperature required to cure DC 996 does not affect shellac-bonded mica or core plating.

The new silicone varnish was developed to provide manufacturers of new equipment and rewinders of old equipment with a heat resistant, waterproof silicone varnish requiring no special equipment or curing and no special techniques for successful application.

Graphitic Mica In Paint Pigments NP 196

Two years of research has shown that graphitic mica in a wide variety of standard metal primer formulations in laboratory exposure and practical service tests improve adhesion, flexibility, toughness, corrosion resistance and general film durability, according to Dr. R. Shutt, of the Chemical and Pigment Company.

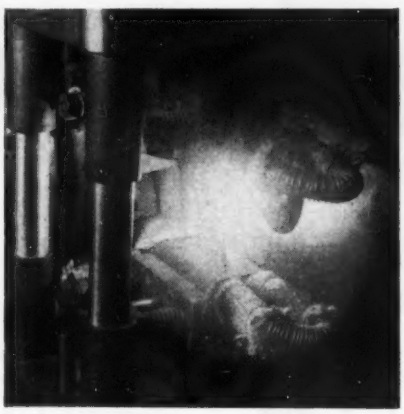
Tests show that graphitic mica may replace up to 67 per cent of the primer pigments such as red lead, zinc chromate, blue lead and zinc dust to produce more durable primers at lower cost.

Alkali-Free Glass Transmits Ultra-Violet NP 197

Discovery of why glass picks up an invisible "suntan" under the bombardment of ultraviolet radiation was reported recently by a Westinghouse scientist.

Dr. Harvey C. Rentschler, director of the Westinghouse Lamp Research Laboratories at Bloomfield, N. J., has found that alkali in glass causes the "glass suntan," known as solarization.

The solarizing effect, he explained, is a phenomenon similar to suntanning of the skin, where a desirable protective layer



is built up to screen out the skin-reddening ultraviolet radiations of the sun. In special glasses which transmit bacteria-killing ultraviolet radiations produced by a lamp, solarization is undesirable since it cuts down the efficiency of the lamps.

The reason that ultraviolet rays of the sun cannot break through ordinary window glass is generally attributed to the presence of metallic oxides in the panes which block out these rays. In the special glasses which transmit bactericidal radiations, Dr. Rentschler concluded that solarization occurs because of the transformation of the metallic oxides from one form to another under the influence of ultraviolet radiation.

Of microscopic thickness, the solarizing screen, which is made up of materials opaque to ultraviolet, has a strong effect on the efficiency of the lamps. The screening action develops rapidly, during the first 100 hours of the lamp's life, reducing radiation as much as 10 to 20 per cent.

To find the answer to the solarization enigma, Dr. Rentschler analyzed the various ultraviolet-transmitting materials spectroscopically.

He observed that alkali, particularly sodium, lines were absent in the spectra of only two of the materials tested. These two, the special glass developed by the Corning Glass Works, and quartz, transmit a maximum of ultraviolet in the bactericidal wave band with negligible solarization. Otherwise, all the glasses tested showed spectral lines indicating they contained very nearly the same amount of iron, magnesium, aluminum, manganese, calcium and titanium.

Organic Fungicide NP 198

Phygon, a new product of the U. S. Rubber Co., is an organic chemical fungicide containing 2,3-dichloro-1,4-napthoquinone. It is a light brown powder, insoluble in water, and may be used either as a dusting powder on seed or dispersed in water as a liquid foliage spray.

Apple scab, which annually damages an estimated ten million bushels, or 8 per cent of the national apple crop, can be controlled by its use, acording to tests by state agricultural experiment stations in various sections.

Aluminum Treating Process NP 199

The Enthone Company has announced a new process, called the "Alumox" process, for chemically treating aluminum and aluminum alloys. It produces a corrosion-inhibiting coating that serves to protect the aluminum against corrosive atmospheres such as salt spray and also presents an excellent base for organic finishes.

The process is stated to be particularly suitable for non-copper containing aluminum alloys. On such alloys, coatings can be obtained with salt spray resistance of 250 or more hours.

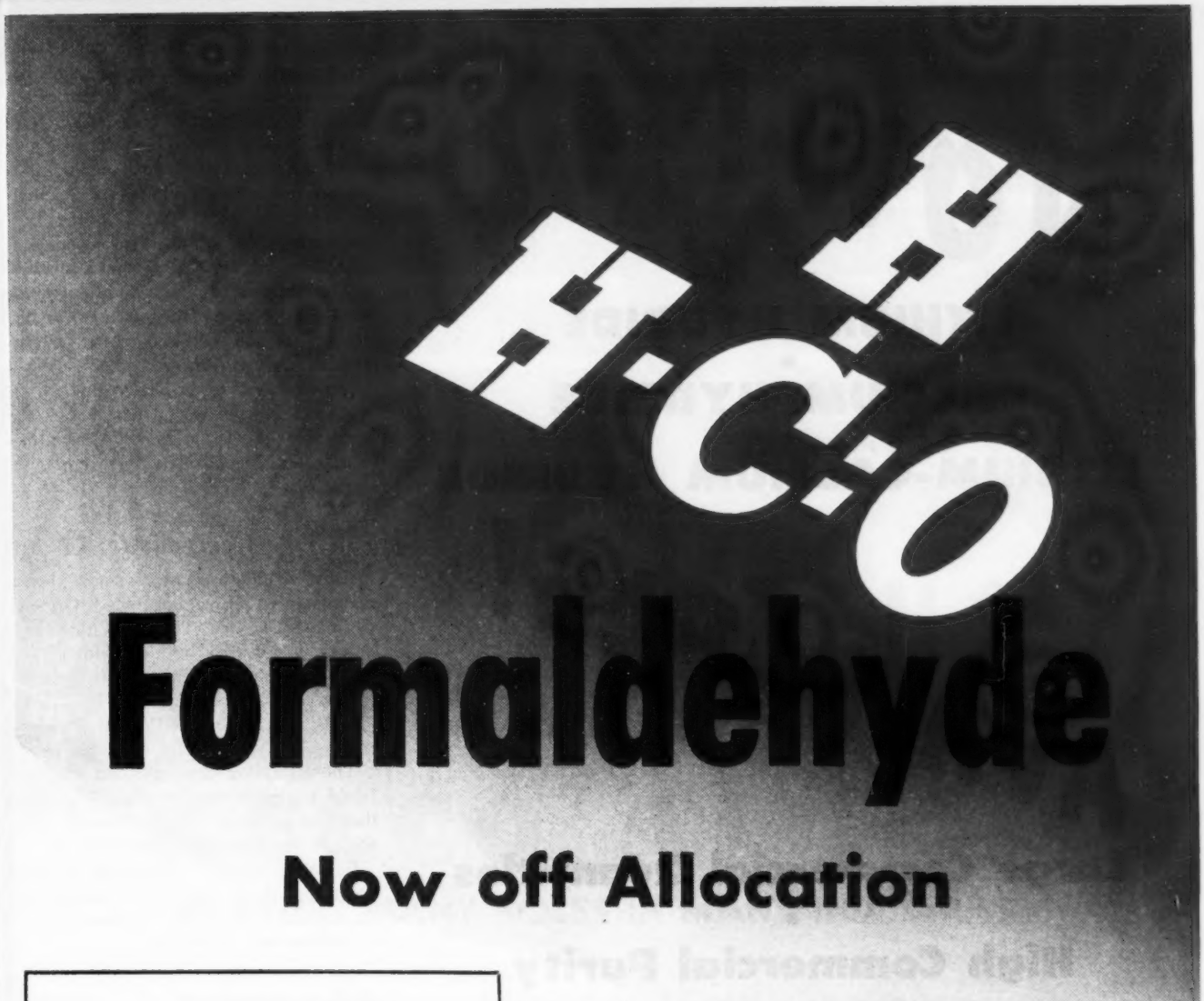
The process requires no electric current and consists of immersing the aluminum in a dilute solution of "Alumox" salts operated near 210° F. from 2 to 15 minutes.

The finish obtained is grayish-green, which is an attractive finish in itself. Further details are given in a booklet available on request.

Copper Dimethylglyoxime Rotproofs Wool NP 200

Investigations conducted at the National Research Council of Canada on the rotproofing of fabrics have resulted in the development of a dimethylglyoxime treatment for copper fixation which is claimed to be superior to the conventional copper naphthenate impregnation.

The research men observed that although copper compounds have been employed extensively for rotproofing fabrics, particularly jute and cotton, copper naphthenate was the only salt normally used commercially, and apparently yielded the best results of those salts which had been investigated. Moreover, even though



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TANK CARS	72,000 lbs.
TANK TRUCKS	18,000 lbs.*
DRUMS	475 lbs.
BARRELS	450 lbs.
KEGS	125 lbs.
12 GALLON CARBOYS	100 lbs.
BOTTLES	1, 5, 9 lbs.

** New York Metropolitan District only*

Heyden 37% Formaldehyde U. S. P. solution is characterized by uniform strength and high purity. Of special interest to all resin and plastic manufacturers are the low acidity and metals content.

For over thirty years Heyden Formaldehyde has been a standard of dependability. Rigid laboratory control assures you of a uniform raw material.

Heyden can supply you with Formaldehyde in any of the convenient quantities mentioned at the left.

Also specify Heyden for Paraformaldehyde and Hexamethylenetetramine.

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Benzaldehyde • Benzoates • Benzoic Acid • Benzyl Chloride • Bromides • Chlorinated Aromatics • Medicinal Creosotes • Formates • Formaldehyde • Formic Acid
Glycerophosphates • Medicinal Guaiacols • Hexamethylenetetramine • Paraformaldehyde • Parahydroxybenzoates • Penicillin • Pentaerythritols • Salicylates

oximes have been used in analytical chemistry for the precipitation of copper ions from aqueous solutions, their possible use as agents for fixing copper in fabrics appeared to have been overlooked.

The Council process embodies dipping the fabrics for two to five minutes in a 0.5 per cent aqueous solution of dimethylglyoxime at 90 to 100 C.., and then immersing them in 5 per cent copper acetate at room temperature for 5 minutes.

The amount of fixed copper may be varied by altering the strength of the copper solution, and the treated fabrics remain odorless, pliable, and are dyed a khaki—rather than a blue—color.

As determined by soil burial tests the treatment proved more effective than with copper naphthenate for rotproofing purposes.

Fluorine Compounds NP 201

Ethyl trifluoroacetate is now being manufactured by Columbia Organic Chemicals Co., Inc. This interesting compound is prepared by the oxidation of trifluorotrichloropropene, and its preparation is covered by U.S. patent No. 2,371,-757 assigned to E. I. du Pont de Nemours & Co., Inc.

The ester is a clear pleasant smelling liquid having a density slightly greater than that of water. It is extremely volatile and has a boiling point of 61° C.

Columbia Organic Chemicals is also producing under the above patent trifluoroacetic acid, sodium trifluoroacetate and difluoroethyl acetate.

dl-Leucine NP 202

Production of synthetic dl-leucine is now under way by the Special Chemicals Division of Winthrop Chemical Company, Inc. Winthrop dl-Leucine is free from isoleucine and other amino acids, as demonstrated by microbiologic assay.

dl-Leucine is one of the ten essential amino acids, required by the rat for optimum growth and by human beings for maintaining positive nitrogen balance. dl-Leucine has also been shown to be essential for mice, dogs and chicks. The following price schedule has been announced:

25 grams	$ 8.50
100 grams	31.00
1 kilogram	280.00

Other synthetic amino acids supplied by Winthrop are tryptophane, methionine, valine and phenylalanine.

pH Test Papers NP 203

A new line of short-range "Hydrion" pH test papers is announced by R. P. Cargille. Six new papers cover the range pH 1.0 to 14.0 and readings can be made to 0.25 pH units throughout this range. These supplement the original "Hydrion" wide range papers. A complete set of Hydrion pH test papers now will consist

PROTEUS
HAD NOTHING ON
KELCO ALGIN
PLAYING MANY ROLES IN MANY INDUSTRIES

Proteus was quite a guy. Mythology says he could be a lion, snake, tiger, anything, to suit any occasion. Similarly, KELCO ALGIN is protean in widespread applications throughout the food, drug and other industries.

As a thickening agent, KELCO ALGIN covers a wide range of viscosities. It provides a wide choice of concentrations for obtaining the correct viscosity called for by the product—as a thickening, suspending, stabilizing, emulsifying, gel-producing or film-forming agent. In addition, KELCO ALGIN is very economical and simple to use.

Our technical department will gladly work with you on any experiment or trial connected with your possible application of KELCO ALGIN. Write us, please.

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of two wide-range and six short-range papers, all in roll form, packaged in four transparent dispensers.

Wood Treatment NP 204

Structures exposed to rapid deterioration by contact with acid solutions or fumes can be made acid-resistant through use of Asidbar, a plastic-impregnated wood developed by Koppers Wood Preserving Technical Department.

In one application in a spray type pickling machine, Southern Yellow Pine guides treated by this process are subjected to 10 per cent to 15 per cent sulfuric acid at temperatures of 180° F. The acid resistant wood is sound and firm after 18 months' service. Untreated wood in this same application lasted only two to three weeks. Fume ducts exhausting the acid fumes from the same machine were built of acid resistant treated wood, and have given similar service. Metallic alloy flues lasted only a short time. Untreated wood fell apart in these ducts after two weeks' exposure.

The plastic treating material is liquefied by high temperature and the wood being processed is immersed in the compound in sealed retorts. The plastic is forced deeply into the wood fibers by high pressure at temperatures sufficiently high to hold the compound in the liquid state. After the impregnation period of 10 to 20 hours, the compound sets up to a plastic-solid distributed in the cells of the wood as it is allowed to cool, to produce the material known as Asidbar. The treatment increases the weight and hardness of wood, and gives it a black surface which need not be painted; resistance to wear and abrasion, water, and chemicals are considerably increased. The properties of Asidbar make it suitable for many requirements of severe service conditions at temperatures to 180° F.

Wood thus treated can be installed with ordinary wood tools. In applications where wood expansion or shrinkage are detrimental the treatment substantially decreases changes of shape and dimension when subject to alternate wetting and drying. Wear resistance also is increased by the increased hardness and other properties given to the wood by the plastic which fills its fibers.

Processing Aid For GR-S NP 205

A new processing aid for GR-S, a petroleum derivative, has been announced by the Sun Oil Co. It has been developed to help in the manufacture and improve the qualities of the finished products made with GR-S such as tires, footwear, sheeting, mechanical goods, etc., and is known as Circosol-2XH.

From the beginning, it was realized by research men in the rubber industry that GR-S lacked certain vital qualities of natural rubber. The search soon turned to

processing aid which would improve the resilience, the life span of the finished products, and at the same time have a low heat build-up in finished products which are constantly under flexing action. Many softeners were tested, but the outstanding value of this new processing aid has been proved over a period of wartime production, it is claimed by the manufacturer.

Waterproofing Compound NP 206

Socony-Vacuum Oil Co., Inc., has developed a wax emulsion which can be added to the rinse water of the wash to make clothing, drapes and other textiles water resistant.

During the war, the availability of the new product for civilians was limited because the armed forces used large quantities for tent duck, uniforms, blankets and other fabrics, making such articles water and mildew repellant.

Such articles as dresses, slacks, play suits, fabric shoes, cloth hats, sports jackets and shorts are especially suited.

It is known as S-V Fabrisec Emulsion, is non-toxic and non-flammable.

Organic Weed-Killer NP 207

A selective weed-killer announced by the U. S. Rubber Company called Polon, is a further development of 2,4-dichlorophenoxyacetic acid, popularly called 2-4-D, which has been widely acclaimed during the past two years as the most efficient selective weed-killer discovered to date.

The new weed-killer is less volatile than normal 2-4-D and therefore more easily controlled.

For instance, the company scientists stated, if a gardener is spraying his lawn with Polon there is less danger that he may harm any nearby vegetation such as his own or his neighbor's tomatoes.

The weed-killer is said to be effective in the control of dandelion, plantain, European bind weed, Canadian thistle, smart weed, chick weed, wild mustard, golden rod, clover, pig weed, rag weed and most all other broad leaf weeds.

Its method of killing is two-fold: first, it kills the leaves of weeds by the usual burning effect; second, the chemical enters the plant sap and causes an excessive rate of development in the root and stems. This is known as a hormone effect. In other words, it causes the plants to grow so vigorously that they die in the process.

Cyanamide Process NP 208

A report received via the British press from the Spanish press refers to the development by S. Nagai and G. Yamaguchi, of the University of Tokyo, of a method which holds out promise for the manufacture of cyanamide without the intermediate production of calcium carbide.

The method consists in treating calcium

(*Turn to page 914*)

NEW CHEMICALS FOR INDUSTRY

Chemical Industries *presents here a catalog of new chemicals and chemical specialties introduced by its advertisers during 1944-45. The arrangement of these listings departs from the practice of former years in that the specialties are grouped separately following the chemicals. These products will be displayed in* Chemical Industries' *exhibit at the 20th Exposition of Chemical Industries, Grand Central Palace, New York, Feb. 25 to Mar. 2, 1946.*

ACETOL
(Hydroxyacetone)

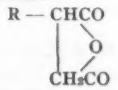
CH_3COCH_2OH. Mol. Wt., 74.08. Sp. Gr., @ 20/20° C. 1.0705. B. P., 145°C. (760 mm.). F. P., −17°C. Colorless, mild-odored liquid completely miscible with water, alcohol, and ether. Combines the chemical reactivity of both the keto and alcohol groups. Certain of its esters may be valuable as solvents for cellulose esters and ethers, as plasticizers, and as lubricants. Other derivatives should be of value as intermediates in the manufacture of dyestuffs and pharmaceuticals. Available in research quantities. Carbide and Carbon Chemicals Corporation.

N-ACETYL ETHANOLAMINE
(Hydroxyethyl Acetamide, Ethanol Acetamide)

$CH_3CONHC_2H_4OH$. Mol. Wt., 103.07. Sp. Gr., 1.122 @ 20/20°C. B. range, 150 to 152°C. (5 mm.). R. I., 1.4725 @ 20°C. Water-soluble. Presence of an amide group assures diversified solubility and compatibility. Uses: plasticizer for polyvinyl alcohol and cellulosic and protenoid substances. Hygroscopicity is about equivalent to that of glycerol, suggesting its use as a humectant for paper products, glues, and inks. Available in research quantities. Carbide and Carbon Chemicals Corporation.

ALKENYL SUCCINIC ACID ANHYDRIDES (ASAA)

Liquid dibasic acid anhydrides represented by the general formula:



where R represents an aliphatic hydrocarbon with olefinic unsaturation. Properties vary with length of side chain, with following description being typical of a $C_{6\text{-}8}$ mixture. Pale yellow oily liquid. Boiling range, 160-180° C./18 mm. Neutral equivalent 98. Density 1.058 grams/cc at 20° C. Slight mineral oil odor. Miscible in all proportions with carbon tetrachloride, benzene and raw linseed oil. Soluble in alcohols but react to form half esters. Slightly soluble in water at room temperature reacting slowly to form AS acids. Suggested uses: Resins, modified oils, modified rubber, plasticizers, driers, lubricant adjuncts, emulsifying agents. Available in drum quantities. The Solvay Process Company.

ALLYL CHLOROFORMATE

$C_4H_5O_2Cl$ (allyl chlorocarbonate); Mol. Wt., 120.54; Sp. Gr., 15.5°/15.5° C., 1.143 ± .004; R. I., n20/D, 1.423 to 1.424; B. Range, 108° to 114° C.; Flash Point (Tag Closed Cup), 31° C. Dissolves in water with difficulty accompanied by slow hydrolysis. Miscible with most organic solvents. Water-white, mobile liquid, powerful lachrymator. Chemical properties: The presence of the unsaturated allyl radical coupled to the reactive chloroformate group affords great versatility in the preparation of synthetics. Chloroformates react with Mg and halogen derivatives of aliphatics to form tertiary alcohols. Other reactions typical of chloroformates are possible. Suggested uses: Preparation of organic intermediates, manufacture of resins. Agent for maintaining mildly acid conditions by low hydrolysis in polymerization reactions. Available in experimental quantities. Hooker Electrochemical Co.

N-ALLYLETHYLENEDIAMINE

$H_2NC_2H_4NHCH_2CH:CH_2$. Colorless liquid. Boiling point 165°. Miscible with alcohol and water. Suggested uses: Intermediate. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

ALLYL FORMATE

Physical state, liquid, colorless. Mol. Wt., 102. B. P., 82-85° C. Solubility: Sl. sol. in water; sol. in most organic solvents. Suggested uses: Fumigants, solvents. Victor Chemical Works.

Additional new products developed by advertisers in 1944-45 may be included in the exhibit, the Exposition supplement, and the February issue of Chemical Industries *provided that descriptions are received by December 21.*

ALUMINUM PHOSPHATE (precipitated)

Physical form, white powder; R. I., N_D, below 1.420; insol. in water. Uses: Adsorbent, polishing agent, surface conditioner, and in the manufacture of ceramics. Victor Chemical Works.

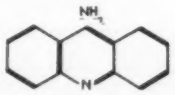
ALUMINUM PYROPHOSPHATE

$Al_4(P_2O_7)_3$. White powder or granular material. Insoluble in water, slightly soluble in acids. Suggested uses: Phosphate glasses. Ceramic compositions. Also as catalyst. Monsanto Chemical Co.

ALUMINUM SILICO PHOSPHATE

Mixture of aluminum silico phosphates. White to gray powder or granular material. Insoluble in water, slightly soluble in acids. Suggested uses: Phosphate glasses, ceramic compositions. Monsanto Chemical Co.

9-AMINOACRIDINE



(Called 5-Aminoacridine in the British Empire.) Mol. Wt., 194; M. P., 233-7° cor.; $E^{1\%}_{1\,cm}$ at 400 mμ = 456-480. Insol. in water; sl. sol. in dil. HCl. Antiseptic for topical use. Yellow powder, which differs from other acridine antiseptics in that it does not stain tissues, bedclothes or bandages and is stable to light. Active in great dilutions against many pathogenic organisms. Not inactivated by p-aminobenzoic acid. Compatible with sulfonamides, 5% procaine HCl, alcohol, 1: 1000 epinephrine HCl, 1: 1000 ephedrine HCl. Winthrop Chemical Co., Inc.

o-AMINOBICYCLOHEXYL
(2-Aminobicyclohexyl)

$C_{12}H_{23}N$. Colorless liquid. Mol. Wt., 181.19; B. P., 270° C. @ 760 mm.; Sp. Gr., 0.933 @ 25°/25° C.; R. I., 1.495 @ 25° C.; Assay, approximately 96%. Soluble in alcohol, benzene and dilute mineral acids. Very slightly soluble in water. Suggested uses: As a possible intermediate for dyes, rubber chemicals, insecticides, plasticizers, etc. Availability: Limited commercial quantities. Monsanto Chemical Co.

o-AMINOBIPHENYL PHOSPHATE

Primary, $(C_{12}H_9NH_3)H_2PO_4$; secondary, $(C_{12}H_9NH_3)_2HPO_4$; tertiary, $(C_{12}H_9NH_3)_3PO_4$. Hard white crystalline solids. Monsanto Chemical Co.

4-AMINO-2-BUTANOL

$CH_3CHOHCH_2CH_2NH_2$. Mol. Wt., 89.1. B. Range, 175-185°C. Sp. Gr. at 20/20°C., 0.918. R. I., $N^{20}D$, 1.453. Flash pt., 140°F. Water-white liquid sol. in water, ethanol, benzene and most organic solvents. Uses: Synthesis of textile assistants, emulsifying agents, dyestuffs, pharmaceuticals and insecticides. Available in research quantities. Sharples Chemicals Inc.

5-AMINO-8-HYDROXYQUINOLINE

$(OH)(NH_2)C_9H_5N$. Mol. Wt., 160. Needles (from benzene), m.p. 143°. Dihydrochloride: needles, soluble in water. Suggested uses: Intermediate for drugs and dyes. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

1-AMINO-5-NAPHTHOL

$C_{10}H_6(OH)(NH_2)$. Mol. Wt., 159.2. M. P., 190-191°C. Purplish grey powder. Suggested uses: Preparation of dyes, pharmaceuticals and photographic chemicals. Available in limited quantities. National Aniline Div.

N-(o-AMINOPHENYL)-ETHYLENE-DIAMINE HYDROCHLORIDE

$H_2NC_2H_4NHC_6H_4NH_2 \cdot 3HCl$. Mol. Wt., 260.5. Colorless prisms (from conc. HCl) soluble in water; insoluble in alcohol and other organic solvents. M.p. 211° dec. Suggested uses: Intermediate for dyestuffs and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

N-(p-AMINOPHENYL)-ETHYLENE-DIAMINE HYDROCHLORIDE

$H_2NCH_2CH_2NHC_6H_4NH_2 \cdot 3HCl$. Mol. Wt., 260.5. Colorless prisms (from conc. HCl and

methanol). Melting point 284° dec. Suggested uses: Intermediate for dyestuffs and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

p-AMINO PHENOL OXALATE, ACID SALT

$NH_2C_6H_4OCOCOOH$. Mol. Wt., 157.12. Purplish crystals. M. P., 220° C. Solubility in water. Soluble in hot water, less in cold. Used in photography. Available in commercial quantities. City Chemical Corp.

6-AMINOQUINOLINE

$(NH_2)C_9H_6N$. Mol. Wt., 144. Forms crystalline hydrate with $2H_2O$ from water. Anhydrous base. M.p. 114°, B.p. 187°/11 mm. Soluble ethyl alcohol, ether; sparingly soluble in water, ligroin; sublimes. Suggested uses: Intermediate for dyes and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

7-AMINOQUINOLINE

$(NH_2)C_9H_6N$. Mol. Wt., 144. Hydrate: (yellow crystals). M.p. 73.5°. Anhydrous base: M.p. 94°. Forms fluorescent solutions. Suggested uses: Intermediate for dyes and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

8-AMINOQUINOLINE

$(NH_2)C_9H_6N$. Mol. Wt., 144. Yellow crystals from EtOH or ligroin. M.p. 70° C. B.p. 160/22 mm. Soluble in water, volatile with steam. Suggested uses: Intermediate for dyes and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

AMMONIUM PHOSPHOMOLYBDATE

$(NH_4)_2O \cdot P_2O_5 \cdot 24MoO_3 \cdot 4H_2O$. Mol. Wt., 3720.90. Yellow, crystalline powder. Insoluble in water, decomposed by aqua regia. City Chemical Corp.

Tert-AMYL MERCAPTAN

$C_5H_{11}SH$. Sp. Gr., 0.81 @ 60/60° F. B. P., 98-101° C. Purity 85% (impurity is hydrocarbon). Suggested uses: Organic synthesis; pharmaceuticals, insecticides, fungicides, solvent, polymerization modifiers and as an additive in rubber and plastics. Available in experimental quantities. Phillips Petroleum Co.

o-sec-AMYLPHENOL

$C_5H_{11}C_6H_4OH$. Mol. Wt., 164. M. P., 29°C. Sp. Gr. @ 30°C., 0.959. R. I., $N^{30}D$ 1.5179. Flash pt., 235°F. Color, straw. Sol. in most common organic solvents. Uses: Synthesis of pharmaceuticals, insecticides, plasticizers, resins, and anti-skin agents. Available in commercial quantities. Sharples Chemicals, Inc.

p-sec-AMYLPHENOL

$C_5H_{11}C_6H_4OH$. Mol. Wt., 164. M. P., 1°C. Sp. Gr. @ 20°C., 0.964. Color, straw. Sol. in most common organic solvents. Uses: Synthesis of pharmaceuticals, insecticides, plasticizers and resins. Available in commercial quantities. Sharples Chemicals Inc.

AMYL PHOSPHORIC ACID

Mixture of $(C_5H_{11})H_2PO_4$ and $(C_5H_{11})_2HPO_4$. Amber-colored liquid. Sp. Gr., 1.28 @ 25° C. Suggested uses: Soldering flux, rust remover. Monsanto Chemical Co.

2-n-AMYLPYRIDINE

Suggested uses: In the manufacture of disinfectants, medicinals, insecticides, rust preventatives, anti-oxidants, rubber accelerators, wetting agents, and in various organic syntheses. Reilly Tar & Chemical Corp.

4-n-AMYLPYRIDINE

Suggested uses: In the manufacture of disinfectants, medicinals, insecticides, rust preventatives, anti-oxidants, rubber accelerators, wetting agents, and in various organic syntheses. Reilly Tar & Chemical Corp.

AROCLOR 1232

$C_{12}H_8Cl_2$. Practically colorless mobile oil. Sp. Gr., 1.265 @ 25°/25° C.; Dist. Range, 290-325° C. (corr.); R. I., 1.620 @ 20° C.; Viscosity, 50 S.U.S. @ 37.8° C. Suggested uses: As a plasticizer in synthetic resin finishes and for resins and platsic materials. Monsanto Chemical Co.

AROCLOR 5465

$C_{18}H_8Cl_{11}$. Mol. wt., 609.2. Yellow, crystalline, brittle resin. Softening Point, 120° C.; Chlorine content, 64-65%; Dist. Range, 270-315° C. at 3 mm. absolute pressure. Decomposes below boiling point at atmospheric pressure. Suggested uses: High-temperature wax or filler for modifying resins, ingredient in varnishes Monsanto Chemical Co.

ASPARTIC ACID

$H_2NCH(COOH)CH_2COOH$. Mol. Wt., 133.1. M. P., 207.0°C. (in vacuo). White crystalline powder. An optically inactive synthetic product. Sparingly sol. in cold water. Insol. in alcohol. Sol. in acids or alkalies. Available in limited quantities. National Aniline Div.

ATABRINE DI-N-OXIDE-DIHYDROCHLORIDE

$C_{23}H_{30}O_3N_3Cl \cdot 2HCl$. Mol. Wt., 504.5. Short yellow needles (from dilute HCl). M.p. 184-186° dec. Soluble in water; insoluble in most organic solvents. Suggested uses: Chemotherapeutic agent for the treatment of malaria. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

ATLAS 3001

$C_6H_4(COOC_2H_4OC_6H_5)_2$. Di-(phenoxyethyl) phthalate. Mol. Wt., 406.2. Pale, waxy crystals. M. P., 52°C. Acid number: less than 1. 60% compatible with high chloride content polyvinyl chloride-acetate copolymers. Good light and heat stability. Outstanding retentivity in the film. Because of its physical form it is especially suited for use in molding compositions. Suggested uses: plasticizer for vinyl copolymers. In limited production. Atlas Powder Company.

ATLAS G-889

Ethylene glycol monoester of saturated and unsaturated C_{18}—C_{22} fatty acids. Yellow, oily liquid. Partially solidified at room temperature. Insol. in water. Dissolves some in methyl or ethyl alcohol. Sol. in isopropyl alcohol. Dispersible in kerosene, toluene and naphtha. Acid number: not over 5. Low cost plasticizer and tackifier for rosin and related resins used for thermoplastic adhesives. Replaces castor oil in such uses. Gives low temperature tack and flexibility without sacrifice of high temperature adhesion and strength. Shipping weight 8.5 lbs. per gallon. Supplied in 1, 5, and 55 gallon containers. Atlas Powder Company.

ATLAS G-3101

$C_6H_4[COOCH(CH_3)CH_2OC_6H_5]_2$. Di-(*alpha* phenoxy propyl) phthalate (technical). Mol. Wt., 434.2. Acid number: less than 1. Straw colored, viscous liquid. 100% compatible with vinyl resins. Gives good cold flex, high tensile strength and excellent retention in the film. Good stability to light and heat. In limited production. Atlas Powder Company.

BARIUM METAPHOSPHATE

$Ba(PO_3)_2$. White powder. Insoluble in water. Slowly soluble in acids. Suggested uses: Constituent of glasses, porcelains and enamels. Monsanto Chemical Co.

BENZOPHENONE (Pure)

$C_6H_5COC_6H_5$. Mol. Wt., 182.2. M. P., 48.0°C. A colorless fused distilled crystalline solid. Insol. in water. Readily and completely sol. in alcohol. Suggested uses in dyestuff, pharmaceuticals, perfume and insecticide fields. Available in limited quantities. National Aniline Div.

BENZOTRIFLUORIDE

$C_6H_5CF_3$ (alphatrifluorotoluene, phenyl fluoroform); Mol. Wt., 146.1; Sp. Gr., 15.5°/15.5° C., 1.197 ± .001; R. I., n20/D, 1.4145 ± .0005; B. Range, 2.5° including 101° C.; F. Range, — 28.5° to — 29.5° C.; Flash Point (Tag Closed Tester), 12° C. Water-white liquid with aromatic odor. Completely miscible with most common solvents. Thermal stability excellent. Chemical properties: Various derivatives possible include nitro alkoxy-derivatives, chlorinated derivatives, mercury derivatives. The — CF_3 group is strongly meta directing. Suggested uses: Manufacture of dye intermediates, preparation of transformer and dielectric fluids, medicinals, insecticides and other organic synthetics. Available in experimental quantities. Hooker Electrochemical Co.

N-BENZYLACETAMIDE

$C_9H_{11}ON$ (acetobenzylamine); Mol. Wt., 149.19; M. P., 61° C. Cream-colored feather-like crystals, insoluble in water, soluble in alcohol and ether. Suggested uses: Organic syntheses and as a pharmaceutical intermediate. Availability: Small quantities from stock, larger quantities made up to order. The Edwal Laboratories, Inc.

BERYLLIUM BROMIDE

$Be(Br)_2$. Mol. Wt., 168.85. White, deliquescent, needles. Sublimes at 500° C. Soluble in cold water, alcohol and ether. Available in limited quantities. City Chemical Corp.

BEUFA

Butyl esters of unsaturated 18-carbon fatty acids. Reddish-yellow mobile liquid. Iodine number, 115; Acid number, 8; Saponification number, 155; Unsaponifiables, 6%. Insoluble in water, miscible with most organic solvents. Suggested uses: Plasticizer. Monsanto Chemical Co.

BISMUTH ARSENATE (ORTHO)

$BiAsO_4$. Mol. Wt., 347.93. White, crystalline powder. Insoluble in water. City Chemical Corp.

BISMUTH SULFATE, C.P.

$Bi_2(SO_4)_3$. Mol. Wt., 706.18. White powder, acidic reaction. Decomposed by water into basic salt, soluble in acids. Available in moderate quantities. City Chemical Corp.

BORON PHOSPHATE

BPO_4. White semi-granular powder. Soluble in mineral acids. Suggested uses: As raw material for glasses and ceramic compositions. Monsanto Chemical Co.

BUTADIENE MONOCHLOROHYDRIN (80%)

$H_2C=CHCHOHCH_2Cl$. Properties of aqueous solution: Sp. Gr., 20/4, 1.11; Unsaturation as butadiene monochlorohydrin, 83%; Water content, 13%; Organic chlorine content, 29%. Chemical properties: The three functional organic groups, (a) the carbon to carbon double bond, (b) the alcohol hydroxyl group, and (c) the organic chlorine atom, undergo characteristic reactions with a variety of organic and inorganic reagents. Thus, the double bond adds halogens and hypohalous acids, the hydroxyl group may be esterified or etherified, and the chlorine atom may be replaced by an ester, ether, hydroxyl, or nitrile group. Together the hydroxyl group and chlorine atom undergo the typical reaction of a 1,2-chlorohydrin with basic agents to form an alpha-epoxide. In addition, butadiene monochlorohydrin is a substituted allyl alcohol, and certain of its esters form polymers through polymerization of the double bond, in a manner similar to esters of allyl alcohol. Recommended uses: In organic synthesis for the production of unsaturated esters, alcohols, ethers, etc., and in the production of polymer forming compounds. Available in experimental quantities only. Columbia Chemical Division, Pittsburgh Plate Glass Company.

BUTOXYETHYL DIGLYCOL CARBONATE

$(n-C_4H_9OC_2H_4OCO_2C_2H_4)_2O$. Mol. Wt., 394.5; Sp. Gr., 20/4, 1.078; R. I., $n_{20}D$, 1.4426; B. P., 200-206° C. at 2 mm. Hg.; Viscosity at 20° C., 45.3 centipoises; Flash Point, 379° F. Volatility at 100° C., 0.12 mg. loss per sq. cm. per hr. Surface Tension at 20° C., 28.3 dynes per cm. Sol. in water at 25° C., 0.04% by weight. Very stable to hydrolysis by water. Can yield only neutral products and carbon dioxide when hydrolyzed. Miscible with many organic solvents, and compatible with many resins and polymers. Odor, practically none. Suggested uses: As a plasticizer, high boiling solvent, or softening agent and in pharmaceutical and lubricant compositions. Available in commercial quantities. Columbia Chemical Division, Pittsburgh Plate Glass Company.

sec-BUTYLAMINE

$CH_3CH_2CH(NH_2)CH_3$. Mol. Wt., 73.1. B. Range, 63-68°C. Sp. Gr. at 20/20°C., 0.725. R. I., $N^{20}D$, 1.395. Flash pt., <20°F. Water-white liquid, sol. in water, ethanol, benzene and most organic solvents. Uses: Synthesis of pharmaceuticals, dyestuffs, textile assistants and emulsifying agents for floor waxes and emulsion paints. Available in experimental quantities. Sharples Chemicals Inc.

BUTYL CHLORAL

$CH_3CHClCCl_2CHO$. Mol. Wt., 175.5. Sp. Gr., 25/4°C., 1.389. B. P., 165°C. F. P., −1°C. Clear, colorless liquid. Suggested use: Chemical synthesis involving aldehyde condensation products. Westvaco Chlorine Products Corp.

BUTYL CHLOROACETATE, TECHNICAL

$ClCH_2COOC_4H_9$. Mol. Wt., 150.61. Light brownish to greenish colored liquid. Odor: "Banana oil" with some lachrymatory effect. B. P., 178-182° C. @ 760 mm.; Sp. Gr., 1.064 @ 25°/25° C. Free acidity, may contain as much as 0.25% as monochloroacetic. Purity, 97%. Flash point, 161° F. (Cleveland Open Cup). A useful intermediate in organic synthesis. Availability: Experimental quantities. Monsanto Chemical Co.

BUTYL DIGLYCOL CARBONATE

$(n-C_4H_9OCO_2C_2H_4)_2O$. Mol. Wt., 306.4; Sp. Gr., 20/4, 1.068; R. I., $n_{20}D$, 1.4350; B. P., 164-166° C. at 2 mm. Hg; Viscosity at 20° C., 20.9 centipoises; Flash Point, 372° F. Volatility at 100° C., 0.59 mg. loss per sq. cm. per hr. Surface Tension at 20° C., 29.4 dynes per cm. Sol. in water at 25° C., 0.01% by weight. Very stable to hydrolysis by water. Can yield only neutral products and carbon dioxide when hydrolyzed. Miscible with many organic solvents, and compatible with many resins and polymers. Odor, practically none. Suggested uses: As a plasticizer, high boiling solvent, or softening agent, and in pharmaceutical and lubricant compositions. Available in commercial quantities. Columbia Chemical Division, Pittsburgh Plate Glass Company.

1, 3-BUTYLENE GLYCOL

(Butanediol - 1,3)

$CH_3—CHOH—CH_2—CH_2OH$. Mol. Wt., 90.12. Sp. Gr., 1.0059 @ 20/20°C. Vapor pressure 0.06 mm. Hg @ 20°C. B. P., 207.5°C. (760 mm.). R. I., 1.4401 n_D @ 20°C. Heat of vaporization 279 B.t.u. per lb. (1 atm.). Coeff. of expansion, 0.00067 per °C. @ 20°C. Flash point, 250°F. (Cleveland Open Cup). Sol. in water, complete @ 20°C. Combination of humectant and solubility characteristics. Ability to attract and retain water exceeds that of glycerine, while the four-carbon chain in its molecule suggests good compatibility with materials such as glue, resins, inks, essential oils, and paper products. Suggested uses: humectant and mutual solvent in printing and stamp-pad inks; adhesives; textile compounds; printing pastes and dyes; specialty soaps; and paper coatings. Two hydroxyl groups make it of interest as an intermediate in the preparation of alkyd resins, and plasticizers, and for special applications as a solvent. Under suitable conditions, may be dehydrated to crotonyl alcohol. Available in research quantities. Carbide and Carbon Chemicals Corporation.

Tert-BUTYL MERCAPTAN

$(CH_3)_3CSH$. Sp. Gr., 0.804 @ 60/60° F. B. P., 62-64° C. Purity 97% (impurity is hydrocarbon). Suggested uses: Organic synthesis; pharmaceuticals, insecticides, fungicides, solvent, polymerization modifiers and as an additive in rubber and plastics. Available in drums and tank cars. Phillips Petroleum Company.

BUTYL PHOSPHORIC ACID

Mixture of $(C_4H_9)H_2PO_4$ and $(C_4H_9)_2HPO_4$. Straw-colored liquid. 97% acids. Sp. Gr., 1.25 @ 25° C. Water soluble. Monsanto Chemical Co.

n-BUTYL SALICYLATE

This product of the Salicylate series has a slight fruity fougere note. General Drug Co.

BUTYLSTEARAMIDE

$C_{17}H_{35}CONHC_4H_9$. Mol. Wt. 339.6. M. Range 67-70°C. B. Range, 195-200°C. at 2 mm. Sp. Gr. at 20/20°C., 0.869. Color, lt. straw. Uses: Plasticizer for vinyl resins, ethyl cellulose, chlorinated rubber and other elastomers and plastics. May also be useful in synthesis of insecticides, surface active agents, cosmetics, pharmaceuticals and lubricants for textile manufacture. Available in experimental quantities. Sharples Chemicals Inc.

CADMIUM BORATE

$Cd(BO_2)_2$. Mol. Wt., 198.05. White powder. Insoluble in water, soluble in mineral acids. City Chemical Corp.

CADMIUM CYANIDE

$Cd(CN)_2$. Mol. Wt., 164.43. White, crystalline powder. Decompose > 200. Slightly soluble in water, soluble in acids. City Chemical Corp.

CADMIUM FLUORIDE

CdF_2. Mol. Wt., 150.41. White, crystalline powder. Slightly soluble in water, soluble in acids, insoluble in alcohol. City Chemical Corp.

CADMIUM TELLURATE

$CdTeO_4$. Mol. Wt., 304.02. White powder. Insoluble in water, soluble in HCl. City Chemical Corp.

CALCIUM METAPHOSPHATE

$Ca(PO_3)_2$. White powder. M. P., approximately 975° C. Very slowly soluble in water and acids. Suggested uses: Constituent of glasses, porcelains and enamels. Monsanto Chemical Co.

CALCIUM NICOTINATE

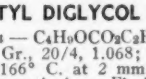
$(C_5H_4NCOO)_2Ca$. Mol. Wt., 284. Colorless prisms, insoluble in water. Suggested uses: Pharmaceutical. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

CALCIUM SELENATE

$CaSeO_4$. Mol. Wt., 183.04. White, crystalline powder. Slightly soluble in cold water, less in hot. City Chemical Corp.

CALCIUM THIOGLYCOLATE

Mol. Wt., 184.23, pH about 11. Loses its water above 100° and decomposes at 250°. White - crystalline powder having a slight sulfuric odor. It is 7% sol. in cold water and 27% sol. in water at 95°. On exposure to air it gradually decomposes to $CaCO_3$. Uses: Dehairing of hides, depilatory preparations. Martin Labs.



CERIUM VALERATE

$Ce_3(C_4H_9CO_2)_9 \cdot 5H_2O$. Mol. Wt., 976.76. Color white, reddish-white powder. Slightly soluble in cold water. City Chemical Corp.

CETYL DIMETHYL BENZYL AMMONIUM CHLORIDE

$C_{16}H_{33}N(CH_3)_2CH_2C_6H_5 \cdot HCl$. Mol. Wt., 396.5. White, semi-crystalline powder, extremely sol. in water. Practically odorless and tasteless. Powerful germicide, phenol coefficient approximately 250. Compatible with alkalies, but not with soaps. Winthrop Chemical Co., Inc.

CHLORAL (Stabilized)

CCl_3CHO. Mol. Wt., 147.4. Sp. Gr., 25/4°C., 1.505. B. P., 97°C. F. P., –57°C. Clear, colorless liquid. Material stabilized against polymer formation. Suggested use: Chemical synthesis in making insecticides and other aldehyde condensation products. Westvaco Chlorine Products Corp.

CHLORAMINE-B

$C_6H_5SO_2NClNa \cdot 1\frac{1}{2}H_2O$ (sodium benzene sulfonchloramide). Chloramine-B is a valuable water soluble chlorine bearing germicide. Mol. Wt., 240. Available chlorine, 29.4% (theoretical). Commercial product is a light tan crystalline product. Water solutions of Chloramine-B are much more stable than hypochlorites. Suggested uses: May find use as a textile germicide, deodorant, and mild bleaching agent. Also may find use as a deodorizing agent for air conditioning units. An effective sanitizing and germicidal agent. Available in wooden barrels, 200 pounds, net. Wyandotte Chemicals Corp.

COBALT BORATE

CoB_4O_7. Mol. Wt., 214.22. Pink powder. Insoluble in water. Soluble in acids. City Chemical Corp.

COBALT BROMIDE, ANHYDROUS

$Co(Br)_2$. Mol. Wt., 218.77. Green deliquescent crystals. Soluble in cold and hot water, soluble in alcohol. City Chemical Corp.

COLUMBIUM CHLORIDE

$CbCl_5$. Mol. Wt., 270.59. Color—yellow deliquescent. M.P. 194°. Solubility—decomposes in cold water. Soluble: HCl, CCl_4, alcohol. Sp. Gr., 2.75. B. P., 240.5°. City Chemical Corp.

COMPOUND G-4

bis-(2-Hydroxy-5 Chlorophenyl) Methane

$(HOC_6H_3Cl)_2CH_2$. Mol. Wt., 269. White crystalline solid. M. P., 177-178°C. Sol. in alkaline solution, alcohols and ketones; insol. in water. Color, technical—light tan; pure—near white. Odor, very slightly phenolic. Suggested uses: As a mildew and rot-proofing agent, germicide, fungicide and antiseptic. Ship. reg., NOIBN. Givaudan-Delawanna, Inc.

COMPOUND G-11

Bis-(2-Hydroxy-3, 5, 6 Trichlorphenyl) Methane

$(HOC_6H_3Cl_3)_2CH_2$. Mol. Wt., 394.84. White crystalline solid. M. P., 164-165°C. Practically insol. in water; sol. in alcohol, acetone and dilute alkalies. Suggested uses: As a germicide for soap, cosmetics and pharmaceuticals. Ship. reg., NOIBN. Givaudan-Delawanna, Inc.

COPPER IODATE

$Cu(IO_3)_2 : H_2O$. Mol. Wt., 431.43. Blue crystals. Slightly soluble in water. Soluble in NH_4OH and dilute acids. City Chemical Corp.

COPPER MERCAPTOBENZOTHIAZOLE

Golden colored powder, very slightly soluble or insoluble in H_2O, C_2H_5OH, ether, acetone, ethyl, acetate, $CHCl_3$, C_6H_6, and naphtha. Uses: Insecticide, fungicide. Monsanto Chemical Co.

COPPER PYROPHOSPHATE

$Cu_2P_2O_7 \cdot xH_2O$. Pale blue, light, fluffy powder. Insol. in water; sol. in acids; sol. in aqueous sol. of tetrapotassium pyrophosphate. Suggested uses: Catalyst, fungicide and insecticide. Monsanto Chemical Co.

COPPER SELENITE

$CuSeO_3$. Mol. Wt., 190.53. Greenish-blue powder. Insoluble in water. City Chemical Corp.

p-CRESYL CAPRYLATE

Fixative for all floral bouquets. It combines well with Indole. General Drug Co.

l-CYSTINE

$(SCH_2CH_2CH(NH_2)COOH)_2$. Mol. Wt., 240.23. White crystalline powder, decomposes on heating without melting. Optical Rotation, — 204° to — 206°. % N, 11.5-11.7; % S, 26.6-27.2. Less than 0.3% moisture; less than 0.1% ash. Free from methionine, tyrosine and tryptophane. Sl. sol. in cold, more in hot water; sol. in mineral acids, strong alkalies; insol. in alcohol. Winthrop Chemical Co., Inc.

DECACHLORO METATERPHENO-DIQUINONE

$C_{18}Cl_{10}O_4$. Orange powder. Water insol.; sol. in alcohol. Suggested uses: Insecticide, oil addition agent. Monsanto Chemical Co.

n-DECYLAMINE

$C_{10}H_{21}NH_2$. Mol. Wt., 157.3. B. Range, 215-221°C. Sp. Gr. at 20/20°C., 0.797. R. I., $N^{20}D$, 1.437. Flash pt., 210°F. Water-white liquid, insol. in water, sol. in ethanol, benzene and most common organic solvents. Uses: Synthesis of pharmaceuticals, resins, wetting and emulsifying agents, and water-repellant agents for textiles; for use in ore flotation. Available in research quantities. Sharples Chemicals Inc.

N-n-DECYLETHYLENEDIAMINE

$H_2NCH_2CH_2NHC_{10}H_{21}$. Mol. Wt., 200. White, waxy solid. M P., 36-37° C. Insoluble in water; soluble in alcohol, ether, chloroform, benzene. Dihydrochloride: $C_{12}H_{28}N_2 : 2HCl$. Mol. Wt., 273. White prisms (from alcohol). M. P., 220-222° dec. Suggested uses: Detergent, intermediate. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

DEO-BASE

A colorless, light petroleum distillate refined to complete freedom from kerosene odor. Number of carbon atoms, 10-12; Average Mol. Wt., 156; API Gravity, 49/51; Sp. Gr. @ 60° F., 0.775/0.785. Saybolt Viscosity @ 100° F., 30/35; Thermo Viscosity, 400. Flash Point (open cup), ° F., 170/180; Initial B. P., ° F., 370/400; Distillation End Point ° F., 480/510. Acid test, U.S.P.; Unsulphonatable Residue, above 97%. Pour Point ° F., – 25. Saybolt Color, 30 + (waterwhite); Odor, practically none. Suggested uses: Insecticide carrier, solvent in the manufacture of paints and printing inks, dry cleaning solvent, pharmaceuticals and cosmetics manufacture, organic synthesis and wherever a purified kerosene type product is specified. L. Sonneborn Sons, Inc.

1,3-DIAMINOBUTANE

$H_2NCH_2CH_2CHNH_2CH_3$. Mol. Wt., 88.2. B. Range, 143-150°C. Sp. Gr. at 20/20°C., 0.858. R. I., $N^{20}D$, 1.450. Flash pt., 125°F. Water-white liquid, sol. in water, ethanol, benzene and most organic solvents. Uses: Synthesis of textile assistants, emulsifying agents, resins, dyestuffs, pharmaceuticals and insecticides. Available in research quantities. Sharples Chemicals Inc.

N,N'-DI(m-AMINOPHENYL)-ETHYLENE-DIAMINE HYDRATE

$H_2NC_6H_4HNCH_2CH_2NHC_6H_4NH_2 \cdot H_2O$. Mol. Wt., 260. Plates or needles from water. M. P., 107° dec. Insoluble cold H_2O; soluble warm solvents. Suggested uses: Intermediate for dyestuffs and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

N,N'-DI-(p-AMINOPHENYL) ETHYLENE-DIAMINE HYDROCHLORIDE

$H_2NC_6H_4NHCH_2CH_2NHC_6H_4NH_2 \cdot 4HCl$. Mol. Wt., 388. Colorless plates (from conc. HCl + methanol). Soluble in water. Suggested uses: Intermediate for dyestuffs and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

5,6-DIAMINOQUINOLINE

$(NH_2)_2C_9H_5N$. Mol. Wt., 159. Brown needles from water). M. P., 95°. Suggested uses: Intermediate for dyes and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

5,8-DIAMINOQUINOLINE

$(NH_2)_2C_9H_5N$. Mol. Wt., 159. Yellow needles. M. P., 156° C. Soluble in ether; sparingly soluble in alcohol. Suggested uses: Intermediate for dyes and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

6,8-DIAMINOQUINOLINE

$(NH_2)_2C_9H_5N$. Mol. Wt., 159. Needles or leaflets, m.p. 162-163° C. Soluble in water and alcohol; less soluble in ether and benzene; sparingly soluble in ligroin and chloroform. Suggested uses: Intermediate for dyes and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

7,8-DIAMINOQUINOLINE

$(NH_2)_2C_9H_5N$. Mol. Wt., 159. Monohydrate: light yellow needles, m.p. 95-97° (from water). Suggested uses: Intermediate for dyes and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

DI-sec-AMYLPHENOL

$(C_5H_{11})_2C_6H_3OH$. Mol. Wt., 235. Sp. Gr. at 20°C., 0.952. Flash pt., >150°F. Color, lt. straw. Sol. in most common organic solvents. Uses: Synthesis of plasticizers, insecticides, textile assistants and pharmaceuticals. Available in commercial quantities. Sharples Chemicals Inc.

2, 5—DIBUTOXYANILINE HYDROCHLORIDE

$C_{14}H_{23}O_2N$:HCl. Mol. Wt., 237.17. Light tan powder. Sol. in water. Uses: Suggested as an organic chemical intermediate, dyestuff base, antioxidant, etc. Availability: Made up to order. The Edwal Laboratories, Inc.

DIBUTOXYTETRAGLYCOL (Tetraethylene glycol dibutyl ether, Dibutoxytetraethylene glycol)

$C_4H_9O(C_2H_4O)_4C_4H_9$. Mol. Wt., 306.43. Sp. Gr., 0.9436 @ 20/20°C. Vapor pressure, <0.01 mm. Hg. @ 20°C. B. P., 330.0°C. (760 mm.). F. P., −20.0°C. Viscosity, 5.7 centipoises @ 20°C. R. I., 1.4357 nD @ 20°C. Flash point, 355°F. Sol. in water, 1.3% by wt. @ 20°C. Sol. of water in it, 4.8% by wt. @ 20°c. A stable, colorless, high-boiling liquid. Wide miscibility and excellent solvent properties typical of the glycol-diethers. Uses: Solvent, plasticizer, lubricant, inert reaction or extraction medium. Solvent for "DDT" dissolving about 50 grams per 100 milliliters of dibutoxytetraglycol. Available in commercial quantities. Carbide and Carbon Chemicals Corporation.

DIBUTYL "CARBITOL" (Diethylene glycol dibutyl ether)

$C_4H_9O(C_2H_4O)_2C_4H_9$. Mol. Wt., 218.33. Sp. Gr., 0.8853 @ 20/20°C. Vapor pressure, 0.02 mm. Hg. @ 20°C. B. P., 254.6°C. (760 mm.). F. P., −60.2°C. Viscosity, 2.39 centipoises @ 20°C. Flash point, 260°F. (open cup). R. I., 1.4233 nD @ 20°C. Sol. in water, 0.3% by wt. @ 20°C. Sol. of water in it, 1.4% by wt. @ 20°C. A colorless, stable, high-boiling liquid typical of the glycol diethers. Has wide miscibility and excellent solvent properties based on the presence of several ether linkages in its structure. Uses: Solvent, extractant, and inert reaction or extraction medium. Shows promise as a dispersing and coupling agent. Available in commercial quantities. Carbide and Carbon Chemicals Corporation.

DIBUTYL "CELLOSOLVE" (Ethylene glycol dibutyl ether)

$C_4H_9OC_2H_4OC_4H_9$. Mol. Wt., 174.28. Sp. Gr., 0.8374 @ 20/20°C. B. P., 203.3°C. (760 mm.). Vapor pressure, 0.2 mm. Hg @ 20°C. F. P., −69.1°C. Viscosity, 1.34 centipoises at 20°C. Flash point, 185°F. (open cup). R. I., 1.4131 nD @ 20–C. Sol. in water, 0.2% by wt. @ 20°C. Sol. of water in it, 0.6% by wt. @ 20°C. A colorless, stable, high-boiling liquid. Inert chemically and has excellent solvent properties for many substances. Uses: extractant, inert reaction medium, and coupling agent. Available in commercial quantities. Carbide and Carbon Chemicals Corporation.

DI-Tert-BUTYL DISULFIDE

$(CH_3)_3CSSC(CH_3)_3$. Sp. Gr., 0.928 @ 60/60° F. B. P., 199-206° C. Purity 98% (hydrocarbon impurity). Suggested uses: Organic synthesis; pharmaceuticals, insecticides, fungicides, solvent, polymerizations modifiers and as an additive in rubber and plastics. Available in drums and tank cars. Phillips Petroleum Co.

DIBUTYLSTEARAMIDE

4°C. B. Rauge, 173-175°C. at 0.4 mm. Sp. Gr. 40°C. B. Range, 173-175°C. at 0.4 mm. Sp. Gr. at 20/20°C., 0.860. R. I., $N^{20}D$, 1.459. Color, straw. Uses: Plasticizer for vinyl resins, ethyl cellulose, chlorinated rubber and other elastomers and plastics. May also be useful in synthesis of insecticides, surface active agents, cosmetics, pharmaceuticals and lubricants for textile manufacture. Available in experimental quantities. Sharples Chemicals Inc.

1,4-DICHLOROBUTANE

$ClCH_2CH_2CH_2CH_2Cl$. Mol. Wt., 127.02. B. P., 155°C. at 760 mm. Sp. Gr., 1.141 at 20°/4°C. Colorless, mobile liquid with mild, pleasant odor. Sol. in most common organic solvents; insol. in water. Heretofore relatively unavailable alpha, omega aliphatic dichloride. Suggested use: Bifunctional intermediate with two highly reactive chlorine atoms, for organic synthesis. Available in limited quantities. E. I. du Pont de Nemours & Co., Inc.

DICHLOROCUMENE

$(CH_3)_2CHC_6H_4Cl_2$ (Isopropyldichlorobenzene); Mol. Wt., 190.1; Sp. Gr., 15.5°/15.5° C., 1.175 ± .005; R. I., n20/D, 1.534; B. Range, 230° to 240° C.; F. P., supercools; Flash Point (Cleve. Open Cup), 110° C.; Fire Point (Cleve. Open Cup), 146° C.; Sol. in Water, exceptionally low. Water-white liquid of mild aroma. Completely miscible with most common solvents. Chemical properties: Aniline derivatives may be prepared by nitration and reduction. Sulfonation will form derivatives suitable for various syntheses. Can be oxidized to form chlorophenyl propionic acids. Both ring and side chain chlorination are possible. Suggested uses: Preparation of dyes, wetting agents, emulsifiers, corrosion inhibitors, non-flammable dielectric, and hydraulic fluids. Interesting possibilities in the formation of many organic synthetics of possible use in pharmaceuticals, insecticides, plasticizers, lubricants, etc. Solvent potency combined with low water solubility point to its possible value as a solvent in many types of coating and impregnation formulations. Available in experimental quantities. Hooker Electrochemical Co.

2,3 DICHLOROPROPANOL-1 (Glycerol beta-dichlorhydrin, Glycerol 2,3-dichlorhydrin)

$CH_2ClCHClCH_2OH$. Mol. Wt., 182.99. Sp. Gr., 1.3632 @ 20/20°C. B. P., 184.2°C. (760 mm.). F. P., sets to a glass below −70°C. Viscosity, 19.9 centipoises @ 20°C. R. I., 1.4843 nD @ 20°C. Flash Point, 195°F. (open cup). Sol. in water, 11.3% by wt. @ 20°C. Sol. of water in it, 10.3% by wt. @ 20°C. A clear liquid with a mild odor resembling that of the chlorinated hydrocarbons. Hydroxyl and chlorine groups make it valuable for numerous organic syntheses. Can be esterified with organic acids and will react with compounds capable of substituting for the chlorine atoms. By the use of suitable reagents, dehydrohalogenation will occur forming epoxy compounds. Available in research quantities. Carbide and Carbon Chemicals Corporation.

DICYCLOHEXYL

$C_6H_{11}C_6H_{11}$. Clear mobile liquid. Aromatic odor. Freezing point, 2.2° C.; Sp. Gr., 0.884 @ 25°/15.6° C.; R. I., 1.4790 @ 25° C.; Dist. Range, 5 to 95% between 238-240° C. (corr.). Flash Point, 215° F.; Flame Point, 220° F.; Viscosity, 34.2 S.U.S. @ 100° F. Insol. in water. Sol. in organic solvents. Suggested uses: High-boiling solvent, plasticizer, dielectric. Monsanto Chemical Co.

DIETHYLENE GLYCOL MONOSTEARATE C

$RCOOCH_2CH_2OCH_2CH_2OH$. Mol. Wt., 358. Diethylene glycol monoester of stearic acid. Density: liquid (50° C.), 0.92; solid (20° C.), 0.96. M. P. (open tube), 38-42° C.; pH of 10% dispersion, 7.5. White waxy solid of rubbery consistency. Odorless. Composition: Diethylene glycol mono"stearate", 79%; iodine value, 4.5. Chemical constants: Insol., water; sol., many organic solvents and vegetable oils. Suggested uses: Fat-soluble surface-active material. As a blending, plasticizing, stabilizing and dispersing agent in cosmetic and technical emulsions, rubber, waxes, plastics, paper, protective coatings. Colgate-Palmolive-Peet Co., Organic Chemicals Division.

DIETHYLENE GLYCOL MONOSTEARATE H

$RCOOCH_2CH_2OCH_2CH_2OH$. Mol. Wt., 364. Diethylene glycol monoester of hydrogenated tallow fatty acids. Density: liquid (50°C.), 0.91; solid (20° C.), 1.00. M. P. (open tube), 45-46° C.; pH 10% dispersion, 6.9. White wax-like solid. Odorless. Composition: Diethylene glycol mono"stearate", 79%. Chemical constants: Iodine value, 3.0%. Insol. in water; sol. in many organic solvents and vegetable oils. Suggested uses: Fat-soluble surface-active agent. As a plasticizing, blending, stabilizing and dispersing agent in cosmetic and technical emulsions, rubber, plastics, paper, protective coatings, textiles. Colgate-Palmolive-Peet Co., Organic Chemicals Division.

DIETHYLLAURAMIDE

$C_{11}H_{23}CON(C_2H_5)_2$. Mol Wt., 255.4. M. P., 4°C. B. Range, 166-167°C. at 2 mm. Sp. Gr. at 20/20°C., 0.868. R. I., $N^{20}D$, 1.455. Flash pt., >150°F. Color, very light straw. Uses: Plasticizer for vinyl resins, ethyl cellulose, chlorinated rubber and other elastomers and plastics. May also be useful in synthesis of insecticides, surface active agents, cosmetics, pharmaceuticals and lubricants for textile manufacture. Available in experimental quantities. Sharples Chemicals Inc.

DIETHYLSTEARAMIDE

$C_{17}H_{35}CON(C_2H_5)_2$. Mol. Wt., 339.5. M. Range, 16-18°C. B. Range, 190-205°C. at 1 mm. Sp. Gr. at 20/20°C., 0.866. R. I., $N^{20}D$, 1.460. Flash pt., 375°F. Color, very light straw. Uses: Plasticizer for vinyl resins, ethyl cellulose, chlorinated rubber and other elastomers and plastics. May also be useful in synthesis of insecticides, surface active agents, cosmetics, pharmaceuticals and lubricants for textile manufacture. Available in experimental quantities. Sharples Chemicals Inc.

1,1-DIETHYLUREA (Technical)

$(C_2H_5)_2NCONH_2$. Mol. Wt., 116.2. Low-melting white solid. Uses: Plasticizers, synthesis of textile assistants and resins. Available in experimental quantities. Sharples Chemicals Inc.

1,3 DIETHYLUREA (Technical)

$C_2H_5NHCONHC_2H_5$. Mol. Wt., 116.2. Uses: Plasticizer. Available in experimental quantities. Sharples Chemicals Inc.

DIGLYCEROL (Diglyceryl Ether)

HO—CH_2—CH(OH)—CH_2—O—CH_2—CH(OH)—CH_2OH

Mol. Wt., 166. Composition: diglycerol, 96%; triglycerol, 4%. Analytical Data: Uncombined hdyroxyl as (—OH), 39.3%; Acid number (mg KOH/gm), 0.2%; Color (Lovibond 5¼"), 3.5R 70Y; B. Range at 1 mm pressure, 215°-225° C. Chemical properties: Forms esters with monohydric and polyhydric acids. Contains four reactive hydroxyl groups which react similarly to the hydroxyl groups of glycerol. Suggested uses: Manufacture of alkyd resins. Plasticizer for urea-formaldehyde and other resins. Humectant and solvent. Lower vapor pressure suggests uses in paper, textiles, coatings, emulsions. Available in limited quantities only for experimental investigations and

application research. Colgate-Palmolive-Peet Co., Organic Chemicals Division.

DIGLYCOL CHLOROFORMATE

$(ClCO_2C_2H_4)_2O$. Mol. Wt., 231.0; Sp. Gr., 20/4, 1.389; R. I., $n_{30}D$, 1.4542; B. P., 125-127° C. at 5 mm. Hg; M. P., 5.3-5.7° C.; Viscosity at 20° C., 9.6 centipoises; Flash Point, above 200° C.; Surface Tension at 20° C., 37.8 dynes per cm. Sol. in water at 25° C., 0.3% by weight. Miscible with many organic solvents. Odor, mild, characteristic. Chemical properties: The chloroformate groups undergo characteristic organic reactions of organic acid chlorides, such as reaction with alcohols or amines to produce carbonate or carbamate derivatives. Suggested uses: In organic synthesis, and in the production of plasticizers and modifying agents of low volatility. Available in commercial quantities. Columbia Chemical Division, Pittsburgh Plate Glass Company.

DI-n-HEXYLAMINE

$(C_6H_{13})_2NH$. Mol. Wt., 185.3. B. Range, 233-243°C. Sp. Gr. at 20/20°C., 0.788. R. I., $N^{20}D$, 1.434. Flash pt., 220°F. Water-white liquid, insol. in water, sol. in ethanol, benzene and most common organic solvents. Uses: Synthesis of oil additives, pharmaceuticals, rubber chemicals, insecticides, dyestuffs, inhibitors and surface active agents. Available in experimental quantities. Sharples Chemicals Inc.

DI-Tert-HEXYL DISULFIDE

C_6H_{13} C SS-C C_6 H_{13}. Sp. Gr., 0.948 @ 60/60° F. B. P., 249-277° C. Purity 99% (hydrocarbon) impurity. Suggested uses: Organic synthesis; pharmaceuticals, insecticides, fungicides, solvent, polymerization modifiers and as an additive in rubber and plastics. Available in experimental quantities. Phillips Petroleum Co.

2,2'-DIHYDROXY-1,1'-DINAPHTHYLMETHANE-3,3'-DICRBOXYLIC ACID

$(OH).(COOH)C_{10}H_5CH_2C_{10}H_5(OH)$ (COOH Mol. Wt., 388. Yellow needles, m.p. ×300°. Insoluble in water, alcohol, acetic acid, ether, and benzene; soluble in alkalis, carbonates and bicarbonates. Suggested uses: Pharmaceuticals, dyes. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

2,2'-DIHYDROXYDIPHENYLMETHANE-5,5'-DICARBOXYLIC ACID

(OH) $(COOH)C_6H_3CH_2C_6H_3(OH)$ $(COOH)$. Mol. Wt., 288. White powder (from water). M. P., 105° dec. Soluble in alcohol, glacial acetic acid. Insoluble in cold water, benzene, ligroin. Suggested uses: Preservative, intermediate for drugs. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

DIISOBUTYLAMINE

$[(CH_3)_2CHCH_2]_2NH$. Mol. Wt., 129.2. B. Range, 136-140°C. Sp. Gr. at 20/20°C., 0.745. R. I. $N^{20}D$, 1.410. Flash pt., 85°F. Water-white liquid, insol. in water, sol. in ethanol, benzene and most organic solvents. Uses: Synthesis of pharmaceuticals, dyestuffs, textile assistants, emulsifying agents, inhibitors, antioxidants and rubber chemicals. Available in experimental quantities. Sharples Chemicals Inc.

DIISOBUTYL CARBINOL

$(C_4H_9)_2CHOH$. Mol. Wt., 144.29; Sp. Gr., 0.8123 @ 20°/20° C.; B. P., 178.8° C. (760 mm.). Sol. in water, less than 0.5 gram per liter @ 20° C. Lbs. per gal., 6.77 @ 20° C. Suggested uses: In lacquers to obtain blush resistance and flow-out properties and as a solvent. Available in small quantities for experimental investigation. Shell Chemical Division of Shell Union Oil Corp.

DIISOPROPYLAMINE

$[(CH_3)_2CH]_2NH$. Mol. Wt., 101.2; Density at 20° C., 0.7180; R. I., N_D^{20}, 1.3918; B. P., 83.7° C. (760 mm.); Fr. P., below — 60° C. Flash Point (Tag open cup), 18° F. Coef. of thermal expansion (20° C. to 30° C.), 0.0016. pH of 0.1 M aqueous solution, 11.1. Sol. at 30° C.: in water, 15 ml./100 ml.; of water in diisopropylamine, 45 ml./100 ml.; misciable with most organic solvents including 95% ethanol, butanol, ether, petroleum ether, benzene, carbon tetrachloride, 2-nitropropane, dibutyl phthalate. Odor, ammoniacal. Color, water-white. Shipping containers and net weights: 55-gal. drum, 320 lb.; 5-gal. drum, 30 lb.; 1-gal. can, 6 lb. Chemical properties: A medium-boiling secondary amine of high purity. Suggested uses: As a starting material in the manufacture of such products as rubber chemicals, textile specialties, detergents, inhibitors, dyes, pharmaceuticals and anti-oxidants. Available in experimental quantities. Commercial Solvents Corporation.

$[(CH_3)_2CH]_2NH$. Mol. Wt., 101.2. B. Range, 80-85°C. Sp. Gr. at 20/20°C., 0.718. R. I. $N^{20}D$, 1.395. Flash pt., 20°F. Water-white liquid sol. in water, ethanol, benzene and most organic solvents. Uses: Possible raw material in synthesis of pharmaceuticals, dyestuffs, textile assistants, emulsifying agents, inhibitors, antioxidants, plasticizers and rubber chemicals. Available in experimental quantities. Sharples Chemicals Inc.

DI-LEAD ORTHOPHOSPHATE

$PbHPO_4$. White non-hygroscopic powder. Sol. in acids. Hydrolyzes in water to form a more basic lead phosphate. Monsanto Chemical Co.

DIMETHYLALKYLAMINE OXIDES

$(CH_3)_2C_nH_{2n+1}NO$ or $(CH_3)_2C_8H_{2n-1}NO$, C_nH_{2n+1} being a high molecular alkyl radical C_8H_{2n-1} being the 9-octadecenyl radical. Available in 20% aqueous solutions. Color of aqueous sol., light yellowish. Chemical properties: Strongly surface-active, foaming, stable at boiling. Stable in presence of acids, alkalies or salts. Industrial Division, Onyx Oil & Chemical Co.

DIMETHYL "CELLOSOLVE" (Ethylene glycol dimethyl ether)

$CH_3OC_2H_4OCH_3$. Mol. Wt., 90.12. Sp. Gr., 0.8692 @ 20/20°C. Vapor pressure, 61.2 mm. Hg @ 20°C. B. P., 85.2°C. (760 mm.). F. P., −71°C. Flash point, 40°F. (Open Cup). Sol. in water, complete @ 20°. Sol. of water in it, complete @ 20°C. Lowest molecular weight glycol diether—a stable, colorless liquid with excellent solvent properties and an absence of reactive groups. Completely miscible with ethanol, acetone, ethylene dichloride, ethyl acetate, toluene, heptane, castor oil, pine oil and isopropyl ether. Uses: Offers particular advantages as a solvent, and as an inert reaction or extraction medium. Used in the analysis of Ethyl Fluid for chlorine content. Available in research quantities. Carbide and Carbon Chemicals Corporation.

DIMETHYL CYCLOHEXANE

$C_6H_{10}(CH_3)_2$. Mol. Wt., 112.21; Sp. Gr., 15.5°/15.5° C., 0.776; R. I., n20/D, 1.426; Dist. Range, 2° including 120° C.; F. P., below — 75° C.; Flash Point (Tag Closed Tester), 13° C. Water-white liquid with mild odor, consisting of three isomers in approximately the following proportions: 12 parts meta-, 7 parts para-, and 1 part ortho-. Above physical data apply to laboratory refined material. Technical grade also available. Chemical properties: Resembles the aliphatic hydrocarbons more than those of the aromatic series. Can be oxidized or reacted with halogens to yield products of potential value in organic synthesis. Available in experimental quantities. Hooker Electrochemical Co.

DIMETHYL ITACONATE

$CH_2 : C(COOCH_3)CH_2COOCH_3$. Mol. Wt., 158.15. Sp. Gr., 1.27 @ 24° C. (solid), 1.12 @ 40° C. (liquid). Sol., 2.2 parts in 100 cc H_2O @ 20° C. Fr. P., 36° C. B. P., 105-106° at 20 mm. Colorless crystalline solid, having a characteristic, somewhat mild ethereal odor. Neutral in reaction. Suggested uses: Polymerizes readily, forming clear, glass-like resins of high refractive index. Grade—Tech. Chas. Pfizer & Co.

N,N'-DI(m-NITROPHENYL)-ETHYLENEDIAMINE

$O_2NC_6H_4NHCH_2CH_2NHC_6H_4NO_2$. Mol. Wt., 302. Needles or plates from glacial acetic acid. M. P., 206°; insoluble in alcohol, chloroform, benzene. Salts hydrolyze in dilute solution. Suggested uses: Intermediate for dyes, pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

N,N'-DI(o-NITROPHENYL)-ETHYLENEDIAMINE

$O_2NC_6H_4NHCH_2CH_2NHC_6H_4NO_2$. Mol. Wt., 302. Orange needles (from benzene). M. P., 190° C. Insoluble cold alcohol, ether, benzene. Suggested uses: Intermediate for dyes, pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

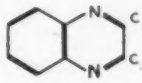
N,N'-DI(p-NITROPHENYL)-ETHYLENEDIAMINE

$O_2NC_6H_4NHCH_2CH_2NHC_6H_4NO_2$. Mol. Wt., 302. Yellow crystals from nitrobenzene. M. P., 216-217°. Insoluble in hot ethyl alcohol. Suggested uses: Intermediate for dyes and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

2,4-DINITROTHIOPHENE

$(NO_2)_2C_4H_2S$. Yellow needles (from alcohol). M. P., 52-54°. Insoluble in water. Suggested uses: Intermediate. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

2,3-DIPHENYLQUINOXALINE



$C_{20}H_{14}N_2$. Mol. Wt., 282. White needles from boiling alcohol. M. P., 125-126°. Soluble in ether, chloroform, and benzene; insoluble in water. Suggested uses: Intermediate for pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

2,3-DIPHENYLQUINOXALINE-DI-N-OXIDE

$C_{20}H_{14}N_2O_2$. Mol. Wt., 314. Short yellow needles (from ethanol); M. P., 210°. Suggested uses: Chemical intermediate. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

DIPROPYLAMINE

$(CH_3CH_2CH_2)_2NH$. Mol. Wt., 101.2. B. Range, 105-110°C. Sp. Gr. at 20/20°C., 0.740. R. I. $N^{20}D$, 1.405. Flash pt., 45°F. Water-white liquid sol. in water, ethanol, benzene and most organic solvents. Uses: Possible raw material in synthesis of pharmaceuticals, dyestuffs, textile assistants, emulsifying agents, inhibitors, antioxidants, plasticizers and rubber chemicals. Available in experimental quantities. Sharples Chemicals Inc.

N,N'-DISTEAROYLETHYLENEDIAMINE

$C_{17}H_{35}CONHCH_2CH_2NHCOC_{17}H_{35}$. Mol. Wt., 592. White crystalline product, insoluble in water. M. P., 140-142° C. Suggested uses: Wax, intermediate for detergents. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

DODECYL DISULFIDE

Brown liquid. Boiling Point, above 220° at 5 mm. Slight sulfide odor. Sol. in ethyl alcohol, acetone, petroleum ether, benzene. Insol. in water, sl. sol. in methyl alcohol. Uses: Rubber chemical intermediate, oil additives. Availability: Production quantities. Monsanto Chemical Co.

N-n-DODECYLETHYLENEDIAMINE

$H_2NCH_2CH_2NHC_{12}H_{25}$. Mol. Wt., 228. White, waxy solid. M. P., 36-38° C. Insoluble in water; soluble in ether, chloroform, benzene, alcohol. Dihydrochloride, $C_{14}H_{32}N_2 \cdot 2HCl$. Mol. Wt., 301. Colorless prisms (from alcohol). M. P., 222-224° dec. Suggested uses: Detergent, intermediate. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

Tert-DODECYL MERCAPTAN

$C_{12}H_{25}SH$. Sp. Gr., 0.871 @ 60/60° F. B. P., 224-232° C. Purity 97% (hydrocarbon impurity). Suggested uses: Organic synthesis; phamaceuticals, insecticides, fungicides, solvent, polymerization modifiers and as an additive in rubber and plastics. Available in experimental quantities. Phillips Petroleum Co.

$C_{12}H_{25}SH$. tert-Dodecyl Mercaptan. Mol. Wt., 202.4. Freezing pt., <−70°C. B. Range, 220-233°C. Sp. Gr. at 20/20°C., 0.860. R. I. $N^{25}D$, 1.468. Flash Pt., 205°F. Water-white liquid with characteristic mercaptan odor. Uses: Polymerization regulator, intermediate for organic synthesis. Available in semi-commercial quantities. Sharples Chemicals Inc.

2-ETHANOLYPYRIDINE

Purity 95% minimum. B. P. at 10 mm Hg, 117° C.; at 760 mm Hg, 235° C. (with decomposition); Mol. Wt., 123. Miscible with water, aromatic hydrocarbons, alcohols, ethers and ketones; Sl. sol. in aliphatic hydrocarbons Suggested uses: In the manufacture of pharmaceuticals, insecticides, fungicides, rubber accelerators, anti-oxidants, disinfectants, lubricants, and for numerous organic syntheses. The solubility properties suggest its use as a coupling or blending agent. Reilly Tar & Chemical Corp.

4-ETHANOLPYRIDINE

Available in 95% pure grade. Suggested

uses: In manufacture of pharmaceuticals, dyestuffs, rubber accelerators, fungicides, insecticides, disinfectants, wetting agents, plastics and inhibitors. Reilly Tar & Chemical Corp.

ETHANOLUREA (Technical)

$NH_2CONHCH_2CH_2OH$. Mol. Wt., 104.1. F. Range, 71-74°C. Color, slight yellow. Uses: Synthesis of plasticizers, textile assistants, and modified urea-formaldehyde resins. Available in semi-commercial quantities. Sharples Chemicals Inc.

ETHYLUREA (Technical)

$C_2H_5NHCONH_2$. Mol. Wt., 88.1. M. Range, 62-76°C. Color, white. Uses: Modify urea-formaldehyde resins, synthesis of plasticizers and textile assistants. Available in experimental quantities. Sharples Chemicals Inc.

b-ETHOXY SALICYLATE

Another of the Salicylate series having value as a modifier in perfumery. General Drug Co.

ETHOXYTRIGLYCOL

(Triethylene glycol monoethyl ether)

$C_2H_5O(C_2H_4O)_2C_2H_4OH$. Mol. Wt., 178.22. Sp. Gr. at 20/20°C., 1.0208. B. P., 255.4°C. (760 mm.). F. P. minus 18.7°C. Vapor pressure, <0.01 mm. Hg. @ 20°C. Viscosity, 7.80 centipoises @ 20°C. R. I., 1.4376 nD @ 20°C. Flash pt., 275°F. (Open Cup). Sol. in water, complete @ 20°C. A colorless liquid of mild odor, retaining many of the excellent solvent characteristics of the lower glycol-ethers. Uses: Solvent for nitrocellulose, plasticizer intermediate, and mutual solvent in cosmetics, perfumes, textile oil specialties, and cutting oils. Available in commercial quantities. Carbide and Carbon Chemicals Corporation.

ETHYL CHLOROACETATE, TECHNICAL

$ClCH_2COOC_2H_5$. Mol. Wt., 122.56. Clear, light straw to tan color. Characteristic sharp odor, strongly lachrymatory in effect. B. P., 141-143° C. @ 760 mm.; Sp. Gr., 1.150 @ 20°/20° C. Free acidity, may contain as much as 0.6% monochloracetic acid. Purity, 97%. Flash point, 128° F. (Cleveland Open Cup). A useful intermediate in organic synthesis. Availability: Experimental quantities. Monsanto Chemical Co.

ETHYLENE GLYCOL MONO-OLEATE C

$RCOOCH_2CH_2OH$. Mol. Wt., 326 . Ethylene glycol monoester of oleic acid. Density (25° C.), 0.918. R. I., 1.462. Melting point, clouds at 15° C., heavy paste at — 10° C. Moisture and water-soluble (ethylene glycol), 2.0%. pH of 10% dispersion, 6.8. Yellow oily liquid. Composition: Ethylene glycol mono"oleate", 81.0%. Chemical constants: Sap. number, 17.48% KOH; uncombined hydroxyl as (—CH) 4.28%; Iodine value, 78%; Acid number, 0.03% KOH. Insol. in water; sol. in many organic solvents. Suggested uses: Blending, dispersing, stabilizing, plasticizing, agent, cosmetic and technical emulsions. Plastics, rubber, textiles, protective coatings, metals, cutting oils. Colgate-Palmolive-Peet Co., Organic Chemicals Division.

ETHYLENE GLYCOL MONOSTEARATE C

$RCOOCH_2CH_2OH$. Mol. Wt., 314. Ethylene glycol monoester of stearic acid. M. P. (open tube), 48-50° C. Density: liquid (60° C.), 0.89; solid (20° C.), 0.96. pH of 10% dispersion, 7.1. Hard white brittle solid, wax-like odor and taste. Composition: Ethylene glycol mono"stearate", 81%. Iodine value, 4.5%. Insol., water; sol., many organic solvents and vegetable oils. Suggested uses: Plasticizing, blending, dispersing, stabilizing agent, cosmetic and technical emulsions, soaps, waxes, polishes, coatings, rubber, plastics. Colgate-Palmolive-Peet Co., Organic Chemicals Division.

ETHYLENE GLYCOL MONOSTEARATE P

$RCOOCH_2CH_2OH$. Mol. Wt., 328. Ethylene glycol monoester of purified stearic acid (combined fatty acids approx. 90% stearic acid, 6% palmitic, 4% oleic). Density: liquid (60°C), 0,88; solid (20°C), 0.94. pH 10% dispersion, 7.3. Very hard brittle wax. Color, light buff. Odor wax-like. Composition: Ethylene glycol mono"stearate" 82%. Chemical constants: Iodine value, 3.0%; insol. water; sol. in many organic solvents and vegetable oils. Suggested uses: blending, plasticizing agent in waxes, plastic, rubber, polishes, cosmetic and technical emulsions. Colgate-Palmolive-Peet-Co., Organic Chemicals Division.

p-ETHYLPHENOL

B. P., 218.5° C. (760 m.m.); Fr. P., 45° C.; available in 95% pure grade. Suggested uses: Experimentation directed to the manufacture of pharmaceuticals, insecticides, fungicides, dyestuffs, plasticizers, anti-oxidants, synthetic plastics, disinfectants, additives to lubricants and gasolines, wetting agents and in various organic syntheses. Reilly Tar & Chemical Corp.

FERRIC ORTHOVANADATE

$FeVO_3$. Mol. Wt., 154.79. Grayish-brown powder. Insoluble in cold water. Soluble in acids. City Chemical Corp.

FERROUS BORATE

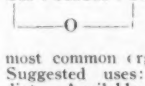
$Fe(BO_2)_2$. Mol. Wt., 141.48. Yellow-green powder. Insoluble in water. City Chemical Corp.

"FLEXOL" PLASTICIZER TOF

(Tri-2-ethylhexyl phosphate)

$[C_4H_9CH(C_2H_5)CH_2O-]_3\ P=O$. Mol. Wt., 434.6. Sp. Gr., 0.9262 @ 20/20°C. Vapor pressure, 2.0 mm. Hg. @ 200°C. B. P., 220°C. (5 mm.). Viscosity, 14.1 centipoises @ 20°C. Flash pt., 420°F. (open cup). R. I., 1.4432 nD @ 20°C. Coeff. of expansion, 0.00081 per °C. @ 20°C. Sol. in water, 0.01% by wt @ 20°C. Sol. of water in it, 1.4% by wt. @ 20°C. Has low vapor pressure, is insoluble in water and is compatible with vinyl chloride and vinyl butyral polymers. Confers some fire-retarding properties to vinyl films. Uses: Plasticizer for the vinyl resins and synthetic rubber where flexibility at very low temperatures and maximum temperature insensitivity are needed. Research quantities now available. Commercial quantities should be available early next year. Carbide and Carbon Chemicals Corporation.

FURAN



Mol. Wt., 68.03; B. P., 31.3°C. at 760 mm. Sp. Gr., 0.937 at 20°/4°C. Colorless liquid. Sol. in most common organic solvents; insol. in water. Suggested uses: Adhesive, chemical intermediate. Available in limited quantities. E. I. du Pont de Nemours & Co., Inc.

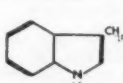
GLYCERYL MONOCOCATE C (Edible)

$RCOOCH_2CHOHCH_2OH$. Mol. Wt., 281 Edible glycerol monoester of cocoant fatty acids. Density: opaque stable solid form (25°C), 1.036; liquid (50°C), 0.98; translucent metastable solid (25°C), 1.015. M. P. (open tube), 40-42° C. pH 10% dispersion, 5.5 Water soluble (glycerol) 25%. Fatty solid, consistency of margarine; color, white; odor, fatty. Slight acrid aftertaste Chemical constants of water-insoluble fraction (75%): a-Monoglyceride (as pure glyceryl monococate), 77%; Iodine value, 6%; insol. in water; sol. in hot vegetable oils and most organic solvents. Suggested uses: Fats soluble surface-active material. Stabilizing, dispersing, lubricating agent in food, cosmetic and technical emulsions, plastics, ink, pigments, protective coatings, textiles, soaps. Colgate-Palmolive-Peet Co., Organic Chemicals Division.

GLYCERYL SALICYLATE E

$C_6H_4(OH)COOCH_2CHOHCH_2OH$. Mol. Wt,. 289. Mixture of glycerol mono and di esters of salicylic acid. U. S. Patent 2,081,117 Density (40° C.), 1.28; R. I. ca. 1.55; pH of 10% dispersion, 5.0 Water soluble (glycerol), 12%. Odorless viscous light colored liquid. Also available glycerol free. Glycerol free glyceryl salicylate: insol. in hot or cold water; sl. sol. in vegetable oils; very sol. in 50% aqueous alcohol, tertiary butanol, ethylene glycol, propylene glycol, diethylene glycol, acetone, propylene glycol monococate. Properties: 99.9% spectral absorbtion between 2950 Å and 3100 Å in film 0.001 mm thickness. Film 0.01 mm thickness gives 99.9% spectral absorbtion between 2750 Å and 3275 Å. Suggested uses: Water-insoluble sunscreen base in suntan preparations. Ultra-violet light inhibitor in plastics, rubber, protective coatings, textiles. Solvent for essential oils, flavoring compounds. Colgate-Palmolive-Peet Co., Organic Chemicals Division.

GRAMINE



$NH—CH_2—N(CH_3)_2$ (3 - Dimethylaminomethylindole, Donaxine). Mol. Wt., 199. Colorless crystals; M. P., 132-133°. Raises or lowers blood pressure, depending on dose and displays other interesting pharmacological epinephrine-like properties. Available in research quantities. Winthrop Chemical Co.

Tert-HEPTYL MERCAPTAN

$C_7H_{15}SH$. Sp. Gr., 0.85 @ 60/60° F. B. P., 148-161° C. Purity 74% (hydrocarbon impurity). Suggested uses: Organic synthesis; pharmaceuticals, insecticides, fungicides, solvent, polymerization modifiers and as an additive in rubber and plastics. Available in experimental quantities. Phillips Petroleum Co.

N-n-HEXADECYLETHYLENEDIAMINE

$H_2NCH_2CH_2NHC_{16}H_{33}$. Mol. Wt., 284. White solid; M. P., 55-57° C. Insoluble in water; soluble in organic solvents. Dihydrochloride: $C_{18}H_{40}N_2 \cdot 2HCl$. Mol. Wt., 357. Colorless prisms from alcohol. M. P., 204-206° dec. Suggested uses: Detergent, intermediate. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

Tert-HEXADECYL MERCAPTAN

$C_{16}H_{33}SH$. Sp. Gr., 0.88 @ 60/60° F. B. P., 254-316° C. Purity 50% (hydrocarbon impurity). Suggested uses: Organic synthesis; pharmaceuticals, insecticides, fungicides, solvent, polymerization modifiers and as an additive in rubber and plastics. Available in experimental quantities. Phillips Petroleum Company.

$C_{16}H_{33}SH$. Mol. Wt., 258.5. B. Range, 148-153° C. at 11 mm. Sp. Gr. at 20/20°C., 0.869. Flash pt., 210°F. Lt. straw colored liquid with characteristic mercaptan odor. Uses: Organic synthesis. Available in limited quantities. Sharples Chemicals Inc.

HEXANEDIOL-2, 5

$CH_3CHOHCH_2CH_2CHOHCH_3$. Mol. Wt., 118.7. Sp. Gr., 0.9617 @ 20/20°C. B. P., 220.8°C. (760 mm.). Flash pt., 230°F. (open cup). R. I., 1.4474 @ 20°C Colorless, nearly odorless liquid completely miscible with water, ethanol, and ether. Suggested uses: Intermediate in the manufacture of plasticizers and synthetic resins; solvent for dyes and resins; mutual solvent. Available in research quantities, Carbide and Carbon Chemicals Corporation.

n-HEXYLAMINE

$C_6H_{13}NH_2$. Mol. Wt., 101.2. B. Range, 126-132°C. Sp. Gr. at 20/20°C., 0.767. R. I. $N^{20}D$, 1.419. Flash pt., 105°F. Water-white liquid, sl. sol. in water, sol. in ethanol, benzene and most organic solvents. Uses: Synthesis of pharmaceuticals, resins, wetting and emulsifying agents. Available in experimental quantities, Sharples Chemicals Inc.

HEXYL "CARBITOL"

Sp. Gr., 0.9385 @ 20/20°C. Vapor pressure, 0.01 mm. Hg. @ 20°C. B. P., 252°C. (760 mm.). F. Pt., sets to a glass below −180°C. C eff. of expansion, 0.00086 per °C. @ 20°C. Sol. in water, 2.8% by wt. @ 20°C. Sol. of water in it, 30.9% by wt. @ 20°C. Uses: Mutual solvent and coupling agent in detergent compositions. May be used in place of Butyl "Carbitol" in many cases where its increased oil solubility would be an advantage. Available in limited commercial quantities. Carbide and Carbon Chemicals Corporation.

HEXYLENE GLYCOL

$(CH_3)_2COHCH_2CHOHCH_3$. Mol. Wt., 118.2, Sp. Gr., 0.9217 @ 20°/4° C.; R. I., 1.4274 @ 20/D; B. P., 197.8° C. (758mm.); Flash Point, 200° F. Acetyl value, 0.832 equiv./100g, Sol. in water, completely miscible at room temperature. Suggested uses: In cutting oils, brake fluids, leather dressings, dry cleaning soap, surface-active agents, etc. Available in small quantities for experimental investigation. Shell Chemical Division of Shell Union Oil Corp.

Tert-HEXYL MERCAPTAN

$C_6H_{13}SH$. Sp. Gr., 0.85 @ 60/60° F. B. P., 130-147° C. Purity 81% (hydrocarbon impurity). Suggested uses: Organic synthesis; pharmaceuticals, insecticides, fungicides, solvent, polymerization modifiers and as an additive in rubber and plastics. Available in experimental quantities. Phillips Petroleum Co.

n-HEXYL SALICYLATE

$C_{13}H_{18}O_3$. Mol. Wt. of 222. Useful in burn ointments and perfumerly, as a modifier in fougere and other types. General Drug Co.

HYDRAZINE

NH_2NH_2. Mol. Wt., 32.05. Sp. Gr., 1.011° (15°/4° C.); B. P., 113.5° C; M. P., 1.4° C. Stable, water-white liquid; fumes on contact with air; strongly alkaline reaction. Use: research. Available in experimental quantities. Fairmount Chemical Co., Inc.

HYDROGEN BROMIDE (Anhydrous)

HBr. Mol. Wt., 80.9. Density (Gas) 2.71 at

0°C. B. P., −68.7°C. Colorless to light yellow liquid under pressure. Suggested uses: Pharmaceuticals, organic and inorganic synthesis, dyestuffs and photographics. Westvaco Chlorine Products Corp.

HYDROGEN PEROXIDE 90 PER CENT

Stable water white solution containing 90% hydrogen peroxide by weight, remainder water. Total residue less than five parts per million. Excellent stability, no detectable loss in one month at 60°C. Can be handled without hazard. Suggested uses: As an oxidizing agent in organic and inorganic syntheses, as highly conc. source of oxygen. Available in commercial quantities. Buffalo Electro Chemical Co.

1-HYDROXY-2-NAPHTHOIC ACID

$C_{10}H_6(OH)(COOH)$. Mol. Wt., 188.2. M. P., 198.8°C. Light buff-colored powder. Very sparingly sol. in water. Sol. in alcohol, benzene, ether and alkalies. Suggested uses: Dyestuff, pharmaceutical and general organic field. Available in limited quantities. National Aniline Div.

8-HYDROXYQUINOLINE SALICYLATE

$(OH)C_9H_6N \cdot C_6H_4(OH)(COOH)$. Mol. Wt., 283. Yellow crystals; M. P., 112-115° C. Slightly soluble in water. Suggested uses: Pharmaceutical product. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

ISOBUTYLAMINE

$(CH_3)_2CH\ CH_2NH_2$. Mol. Wt., 73.1. B. Range, 66-69°C. Sp. Gr. at 20/20°C., 0.733. R I. $N^{20}D$, 1.398. Flash pt., <20°F. Water-white liquid, sol. in water, ethanol, benzene and most organic solvents. Uses: Synthesis of pharmaceuticals, dyestuffs, textile assistants, emulsifying agents and insecticides. Available in experimental quantities. Sharples Chemicals Inc.

ISONOL DL1

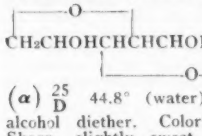
$(C_{12}H_{25})_2(CH_3)_2N$ Br. (approximate; dilauryl dimethyl ammonium bromide. Mol. Wt., 492 (average). Slightly sol. in water; sol. in alcohol and most organic solvents. Color; light amber. Insolubilized by anionic surface-active compounds. A fungicide and bactericide. An emulsifying agent, softening agent for leather, textiles, paper, etc. A wetting and penetrating agent. Available as 75% alcoholic solution. Industrial Division, Onyx Oil & Chemical Co.

ISOPROPYL PALMITATE

$C_{19}H_{38}O_2$. Water-white liquid. Insol. in Water; sol. in alcohol. B. P., 180° C. (10mm), Suggested uses: Non-toxic base in cosmetic and pharmaceutical industries. Limited availability at present. The Beacon Co.

ISOSORBIDE

(1,4:3,6-dianhydrosorbitol)



Mol. Wt., 146. M. P., 62-64°C. B.P., 158-160°C. @ 10 mm. Hg. Optical rotation, $(\alpha)\ \frac{25}{D}$ 44.8° (water). A dicyclic dihydroxy alcohol diether. Colorless crystals. Odorless. Sharp, slightly sweet taste. Readily sol. in water and lower alcohols. Sl. sol. in chloroform, benzene and most organic solvents. Non-toxic. Not assimilated. Can be esterified or etherified by ordinary techniques. Useful as a starting material for synthesis, or as a solvent. In limited production. Atlas Powder Company.

ISOTHAN Q15

$C_9H_8N(C_{12}H_{25})Br$ (approximate); lauryl isoquinolinium bromide, a quaternary ammonium compound. Mol. Wt., 391 (average). Sl. sol. in water; sol. in alcohol and most organic solvents. Available as a 20% water-alcohol solution. Insolubilized by anionic surface-active compounds. A fungicide and bactericide. Effective in the control of fungus diseases of plants. Possesses foaming and penetrating properties. Industrial Division, Onyx Oil & Chemical Co.

ITACONIC ACID

$CH_2 : C(COOH)CH_2COOH$. Mol. Wt., 130; M. P., 167° C. Sol. in water forming a clear solution. 7.6 gm. Itaconic Acid in 100 gm. of water @ 20° C. Fine white odorless crystals. Suggested uses: Being an unsaturated dibasic acid, it should be of interest in the manufacture of resins and plastics. Chas Pfizer & Co.

LEAD METAPHOSPHATE

$Pb(PO_3)_2$. Dense white powder or granular material. M. P., approximately 700° C. Very sl. sol. in water. Suggested uses: As raw material for lead-bearing phosphate glasses, etc. Monsanto Chemical Co.

LEPIDINE

Distills 95% within 2° C. including the temperature of 264.5° C.; Fr. P., 5° C. minimum; available in 95% minimum purity. Sparingly sol. in cold water; sol. in dilute mineral acids and in most organic solvents, including alcohols, ethers, esters, ketones, aliphatic and aromatic hydrocarbons. Suggested uses: In manufacture of pharmaceuticals, dyes, insecticides, rubber accelerators, and in organic syntheses. Reilly Tar & Chemical Corp.

dl-LEUCINE

$(CH_3)_2CHCH_2CH(NH_2)COOH$. Alpha-amino-isocaproic acid. Mol. Wt., 131.11. White crystalline powder; M. P., 286-8°. Less than 0.2% moisture, less than 0.2% ash. Optical rotation, 0. Free from isoleucine. One of the essential amino acids. Winthrop Chemical Co., Inc.

LITHIUM OXALATE, N.F., C.P.

$Li_2C_2O_4$. Mol. Wt., 101.90. White crystals. Slightly soluble in water. Suggested use: Blood analysis. City Chemical Corp.

MDI

(Methylene bis (4-phenyl isocyanate)

$(OCNC_6H_4)_2CH_2$. Mol. Wt., 250; M. P., 43°C. B. P., 210-212°C. at 13 mm. Flash Pt. (ASTM open cup) 210°C. Dark colored liquid (90-95% purity). Reacts rapidly with compounds having a replaceable hydrogen atom, such as all cellulosic materials, many resins, most types of elastomers, alcohols, phenols, amines, esters, acids and water. Polymerizes, particularly at elevated temperatures. Sol. in xylene, gasoline, benzene, chlorobenzene and carbon tetrachloride. Suggested uses: Manufacture of composite articles from textile fabrics and elastomers; increases adhesive bond between elastomer and fabric. Cross-linking agent. Shipping Classification, "Chemicals NOS Liquid—Class B Poison." May be shipped by rail, highway freight and Railway Express, but not by parcel post. E. I. du Pont de Nemours & Co., Inc.

MERCAPTOETHANOL

$HSCH_2CH_2OH$. Mol. Wt., 78.13. Sp. Gr., 1.1168 @ 20/20°C. B. P., 157.1°C. (760 mm.). Vapor pressure, 1.0 mm. @ 20°C. R. I., 1.5011 n_D @ 20°C Flash pt., 170°F. (Open Cup). Viscosity, 3.43 centipoises @ 20°C. Sol. in water, complete @ 20°C. Water-white, mobile liquid with a characteristic odor, resembling both hydrogen sulfide and ethyl alcohol. Miscible with water, benzene, ether, and most organic solvents. Has chemical reactivity of both a mercaptan and an alcohol, and is also a mild reducing agent. Uses: Promising raw material in the synthesis of pharmaceuticals, dyestuffs, rubber chemicals, flotation agents, pickling inhibitors, insecticides, synthetic resins, and plasticizers for synthetis resins. Readily forms metallic salts or mercaptides. Available in research quantities. Carbide and Carbon Chemicals Corporation.

MERCURIC CHROMATE

$HgCrO_4$. Mol. Wt., 316.62. Red crystals. Decomposes in water and acids. City Chemical Corp.

MERCUROUS OXALATE

$Hg_2C_2O_4$. Mol. Wt., 489.24. White crystal powder. Insoluble in water, slightly soluble in HNO_3. City Chemical Corp.

dl-METHIONINE

$CH_3SCH_2CH_2CH(NH_2)COOH$. Mol. Wt., 149. Glistening, colorless plates with a faint burnt hair odor and a sweetish taste. Over 99%. Less than 0.5% moisture, negligible ash. Rotation, 0. Moderately sol. in cold water; very sol. in hot water, dilute mineral acid and dilute alkali; sl. sol. in cold alcohol, moderately sol. in hot alcohol. One of the essential amino acids. Suggested for use in treatment of burns, liver damage, chloroform and carbon tetrachloride poisoning, etc. Winthrop Chemical Co., Inc.

METHYL BENZENESULFONATE, Technical

$C_6H_5SO_2OCH_3$. Mol. Wt., 172.2; color, water white; odor, none; R. I., 1.5145 @ 25° C. Purity 98.6-98.8%, benzene sulfonchloride 0.02%; Sp. Gr., 1.265 @ 25° C.; Lb./gal. 10.60 @ 25° C.; Flash Point, 151° C. (Tag closed cup). B. Range, 274-283° C. (754 mm). Suggested uses: Methylating agent for production of dyestuffs and pharmaceuticals. Less toxic than dimethyl sulfate and may be useful where controlled alkylation is desired, or where sulfonation may occur during alkylation. Available in semi-commercial quantities. Net contents drums, 550 pounds. Wyandotte Chemicals Corp.

METHYL COCATE C

$RCOOCH_3$. Mol Wt., 221. Methyl ester of cocoanut oil fatty acids. Density (20° C.), 0.87; R. I. 1.434. Cloud Point, 8° to 12° C; Solidifying Range, -12° C. to -10° C.; Dist. Range (approx.) at 1 mm pressure, 5% at 75° C., 50% at 105° C., 95% at 150° C. Light yellow liquid. Color 1.5R (5¼" Lovibond). Sharp cocoanut oil-like odor. Chemical constants: Acid value (% KOH), 0.77%; Saponification value (% KOH),. 24.4% Free fatty acids, 2.8%; Iodine value (%I_2), 9.2%. Insol. in water; very sol. in many organic solvents including vegetable oils. Suggested uses: Plasticizers, softeners, lubricants for rubber, textiles, plastics, leather. Also as high boiling point solvents. Available in limited quantities only for experimental investigation and application research. Distilled grade, water white in color, also available. Colgate-Palmolive-Peet Co., Organic Chemical Division.

METHYL COTTONSEED ESTER

$RCOOCH_3$. Mol. Wt., 294. Methyl ester of cottonseed oil fatty acids. Density (20° C.), 0.88; R. I., 1.452. Cloud Point 20° to 25° C.; Solidifying Range, 4° to 6° C.; Dist. Range (approx.) at 1 mm pressure, 5% at 135° C., 50% at 146° C., 95% at 150° C. Light yellow liquid. Color 3R (5¼" Lovibond) Fatty odor. Chemical constants: Acid value (% KOH); 0.56%; Saponification value (% KOH), 19.2%; Free fatty acid, 2.7%; Iodine value as (% I_2), organic solvents including vegetable oils. Suggested uses:, Plasticizers, softeners, lubricants for rubber, textiles, plastics, leather. Also as high boiling point solvents. Available in limited quantities only for experimental investigation and application research. Distilled grade, water white in color, also available. Colgate-Palmolive-Peet Co., Organic Chemicals Division.

3-METHYLISOQUINOLINE

Distills 95% within 2° C. including the temperature of 252.5° C.; Fr. P., 60.5° C. minimum; available in 95% minimum purity. Sparingly sol. in water; sol in dilute mineral acids and in most common organic solvents, including alcohols, ethers, esters, ketones, aliphatic and aromatic hydrocarbons. Suggested uses: In manufacture of pharmaceuticals, dyes, insecticides, rubber accelerators, and in organic syntheses. Reilly Tar & Chemical Corp.

METHYL ISOTHIOUREA SULFATE

White needles. M. P. with dec. @ 236° C. Sol. in water, alcohol; insol. in benzene, petroleum ether and CCl_4. Suggested uses: For preparation of pure methyl mercaptan. Availability: Sample quantities. Monsanto Chemical Co.

METHYL PALMOLATE C

$RCOOCH_3$. Mol. Wt., 291. Methyl ester of palm oil fatty acids. Density (20° C.); 0.88; I., 1.446. Cloud Point, 20° to 25° C.; Solidifying Range, 10° to 14° C.; Dist. Range (approx.) at 1 mm pressure, 5% at 135° C., 50% at 142° C., 95% at 150° C. Oily liquid of yellow color 21R (5¼" Lovibond). Characteristic palm oil odor. Chemical constants: Acid value (% KOH), 0.73%; Saponification value (% KOH), 19.5%; Free fatty acids, 3.5%; Iodine value as (%I_2), 49.5. Insol.in water; Very sol. in many organic solvents including vegetable oils. Suggested uses: Plasticizers, softeners, lubricants for rubber, textiles, plastics, leather. Also as high boiling point solvents. Available in limited quantities only for experimental investigation and application research. Distilled grade, water white in color, also available. Colgate-Palmolive-Peet Co., Organic Chemicals Division.

METHYL PALMOLEOSTEARATE

$RCOOCH_3$. Mol. Wt., 290. Methyl ester of tallow fatty acids. Density (20° C.), 0.87; R. I., 1.446. Cloud Point, 20° to 25° C.; Solidifying Range, 8° to 11° C.; Dist. Range (approx.) at 1 mm pressure, 5% at 135° C., 50% at 142° C., 95% at 150° C. Yellow liquid. Color 5R (5¼" Lovibond). Characteristic fatty odor. Chemical constants: Acid value (% KOH), 0.71%; Saponification value (% KOH), 19.2%; Free fatty acids, 3.4%; Iodine value as (%I_2), 49.2. Insol. in water; very sol. in many organic solvents including vegetable oils. Suggested uses: Plasticizers, softeners, lubricants for rubber, textiles, plastics, leather. Also as high boiling point solvents. Available in limited quantities only for experimental investigation and application

research. Distilled grade, water white in color, also available. Colgate-Palmolive-Peet Co., Organic Chemicals Division.

MEUFA

Methyl esters of unsaturated 18-carbon fatty acids. Yellow liquid. Iodine number, 127; Acid number, 6; Saponification number, 178; Unsaponifiables, 5.5%. Water insol., miscible with most organic solvents. Suggested uses: Plasticizer. Monsanto Chemical Co.

MIXED ISOPROPANOLAMINE

(Mixture of mono-, di, and tri-isopropanolamine)

Tentative specifications: Sp. Gr., 1.004 to 1.010 @ 20/20°C. Equivalent weight, 135 to 145. Water content, less than 0.5%. Monoisopropanolamine content, 14 ± 2%. Diisopropanolamine content, 43 ± 4%. Triisopropanolamine content, 43 ± 4%. Flash point, 245°F. (Open Cup). Color, less than 70 Pt-Co scale. A viscous, hygroscopic liquid with a slightly ammoniacal odor. Completely sol. in water but only sl. sol. in kerosene or white paraffin oil. Combines with free fatty acids to form soaps that are completely soluble in hydrocarbons, even in concentrations below 2 per cent, and have improved color stability. Uses: Its soaps may be employed in most uses now found for the ethanolamine soaps and they are of special interest in soluble oils, dry-cleaning soaps, cosmetics, and pharmaceutical preparations. Because its combining weight is approximately the same as that of triethanolamine, it may be substituted in most formulas calling for triethanolamine, although direct substitution gives cosmetic creams of somewhat thinner consistency. Useful in the preparation of stable water emulsions and of vinyl acetate emulsions of the oil-in-water type for coating fabrics and leather. Available in commercial quantities. Carbide and Carbon Chemicals Corporation.

MONOCHLOROCUMENE

$(CH_3)_2CHC_6H_4Cl$ (isopropylchlorobenzene); Mol. Wt., 155.6; Sp. Gr., 15.5°/15.5° C., 1.035 ± .01; R. I., n20/D, 1.513; B. Range, 190° to 200° C.; F. P., supercools; Flash Point (Cleve. Open Cup), 79° C.; Fire Point (Cleve. Open Cup), 91° C.; Sol. in Water, exceptionally low. Water-white liquid of an aromatic odor. Completely miscible with most common solvents. Chemical properties: Aniline derivatives may be prepared by nitration and reduction. Sulfonation will form derivatives suitable for various syntheses. Can be oxidized to form chlorphenyl propionic acids. Both ring and side chain chlorination are possible. Suggested uses: Preparation of dyes, wetting agents, emulsifiers, corrosion inhibitors, non-flammable dielectric, and hydraulic fluids. Interesting possibilities in the formation of many organic synthetics of possible use in pharmaceuticals, insecticides, plasticizers, lubricants, etc. Solvent potency combined with low water solubility point to its possible value as a solvent in many types of coating and impregnation formulations. Available in experimental quantities. Hooker Electrochemical Co.

MONOMANGANOUS PHOSPHATE

$Mn(H_2PO_4)_2{:}2H_2O$. Gray powder. Sol. in water and acids, insol. in alcohol. Suggested use: For rustproofing steel. Monsanto Chemical Co.

MONOTHIURAD

Light yellow solid. M. P., 104-107° C. Sol. in alcohol, chloroform; slightly sol. in ether; insol. in water. Uses: Accelerator for the vulcanization of natural and synthetic rubber. Availability: Production quantities. Monsanto Chemical Co.

NICKEL LACTATE

$(CH_3CHOHCOO)_2Ni$. Mol. Wt., 236.77. Soluble in water. Greenish crystals. City Chemical Corp.

8-NITRO-7-AMINOQUINOLINE

(NO_2) (NH_2) C_9H_5N. Mol. Wt. 189. Crystals from absolute alcohol. M. P. 194° C. Suggested uses: Intermediate for dyes and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

5-NITRO-6-AMINOQUINOLINE

(NO_2) (NH_2) C_9H_5N. Mol. Wt. 189. Yellow needles from toluene. M. P. 178° C. Suggested uses: Intermediate for dyes and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

o-NITRO BENZOIC ACID

$C_6H_4(NO_2)(COOH)$. Mol. Wt., 167.1. M. P., 147.6°C. Pale pink, crystalline powder and lumps. Very sol. in methyl or ethyl alcohol, ether and acetone. Sparingly sol. in water, benzene, chloroform, carbon disulfide and petroleum naphtha. Suggested use: Synthesis of dyes and pharmaceuticals. Available in limited quantities. National Aniline Div.

N-(o-NITROPHENYL)-ETHYLENE-DIAMINE HYDROCHLORIDE

$H_2NCH_2CH_2NHC_6H_4NO_2{:}HCl$. Mol. Wt. 217.5. Yellow needles (from dilute HCl) sol. in water. M. P. 262° dec. Suggested uses: Intermediate for dyestuffs and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

N-(p-NITROPHENYL)-ETHYLENEDIAMINE

$H_2NCH_2CH_2NHC_6H_4NO_2$. Mol. Wt. 181. Yellow prisms (from boiling water), M. P. 144°. Suggested uses: Intermediate for dyestuffs and pharmaceuticals. Available in small quantities for experimental investigation. Evans Chemetics, Inc.

NITROSYL CHLORIDE

NOCl. A reddish brown gas with an irritating odor. The gas is more than twice as heavy as air and condenses to a red liquid when the temperature is lowered to −5.7° C. at 1 atm. Nitrosyl chloride is non-explosive but dissociates into nitric oxide and chlorine as the temperature is increased. Molecular Wt. 65.47. B. P. —5.7° C. F. P. —69.5° C. Critical temperature 167. 5° C. Critical pressure about 80 atms. Latent heat of vaporization 90 cals./gm. Density of liquid 1.30 at 20° C. Density of gas 3.0 gms./liter at 0° C. and 760 mm. Suggested uses: Flour bleaching, shrinkproofing wool, polymerization catalyst, dye intermediates, metal pickling, digesting cellulosic materials, chlorination of hydrocarbons, preparation of sulfur monochloride. Available in small cylinders for research purposes. The Solvay Process Company.

3-NITROTHIOPHENE

(NO_2) C_4H_2S. Mol. Wt. 129. Pale yellow needles (from ligroin). M. P. 44-45°, insoluble in water, soluble in ether. Suggested uses: Intermediate. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

7-NITROQUINOLINE

(NO_2) C_9H_6N. Mol. Wt. 174. Leaflets or needles from alcohol or water. M. P. 132-133°. Soluble in ether, chloroform, hot alcohol. Sublimes. Suggested uses: Intermediate for dyes and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

5-NITROSO-8-HYDROXYQUINOLINE

(NO) (OH) C_9H_5N. Mol. Wt. 174. Needles (from alcohol), M. P. 245 dec., sparingly soluble in benzene, ether, chloroform, insoluble in water. Suggested uses: Intermediate for dyes and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

2-(5-NONYL) PYRIDINE

Suggested uses: In the manufacture of disinfectants, medicinals, insecticides, rust preventatives, anti-oxidants, rubber accelerators, wetting agents, and in various organic syntheses. Reilly Tar & Chemical Corp.

4-(5-NONYL) PYRIDINE

Suggested uses: In the manufacture of disinfectants, medicinals, insecticides, rust preventatives, anti-oxidants, rubber accelerators, wetting agents, and in various organic syntheses. Reilly Tar & Chemical Corp.

OCTACHLORODIPHENOQUINONE

$C_{12}Cl_8O_2$. Orange-colored powder. Water insol.; sol. in alcohol. Suggested use: Insecticide. Monsanto Chemical Co.

N-n-OCTADECYLETHYLENEDIAMINE

$H_2NCH_2CH_2NHC_{18}H_{37}$. Mol. Wt. 312. White prisms (from dioxane-ligroin). M. P. 64-65°, insoluble in water and ligroin; soluble in alcohol, ether, dioxane, chloroform, benzene. Dihydrochloride: $C_{20}H_{44}N_2 \cdot HCl$. Mol. Wt. 385. Colorless prisms from alcohol. M. P. 194-196° dec. Suggested uses: Detergent, intermediate. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

n-OCTYLAMINE

$C_8H_{17}NH_2$. Mol. Wt., 129.2. B. Range, 170-179°C. Sp. Gr. at 20/20°C., 0.779. R. I. $N^{20}D$, 1.431. Flash Pt., 140°F. Water-white liquid, insol. in water, sol. in ethanol, benzene and most common organic solvents. Uses: Synthesis of pharmaceuticals, resins, wetting and emulsifying agents, and water-repellent agents for textiles; for use in ore flotation. Available in research quantities. Sharples Chemicals Inc.

N-n-OCTYLETHYLENEDIAMINE

$H_2NCH_2CH_2NHC_8H_{17}$. Mol. Wt. 172. White, waxy solid. M. P. 29-31°. Insoluble in water; soluble in alcohol, ether, benezene, chloroform. Dihydrochloride: $C_{10}H_{24}N_2 \cdot 2HCl$. Mol. Wt. 245. White prisms (from alcohol). M. P. 208-210° dec. Suggested uses: Detergent, intermediate. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

OCTYL FORMATE

Physical state, liquid; colorless. B.P., 184-192° C. Sol. in most organic solvents. Victor Chemical Works.

Tert-OCTYL MERCAPTAN

$C_8H_{17}SH$. Sp. Gr. 0.858 @ 60/60° F. B. P. 165-177° C. Purity 99% (hydrocarbon impurity). Suggested uses: organic synthesis; pharmaceuticals, insecticides, fungicides, solvent, polymerization modifiers and as an additive in rubber and plastics. Available in experimental quantities. Phillips Petroleum Co.

$C_8H_{17}SH$.. Mol. Wt., 146.3. B. Range, 159-165°C. Sp. Gr. at 20/20°C., 0.843. Flash Pt., 100°F. Water-white liquid with characteristic mercaptan odor. Uses: Organic synthesis. Available in limited quantities. Sharples Chemicals Inc.

n-OCTYL SALICYLATE

$C_{15}H_{22}O_3$. Molecular weight of 250. Used in burn ointments. Has a mild aroma and is of possible value in perfumery as a modifier. General Drug Co.

OLEYL FORMATE

Physical state, liquid, yellow color. Spr. Gr., 0.866 (30° C.). R. I., 1.448(ND). Saponification Equiv. 282-294. B. P., 140-170° C. at 8 mm. Solubility: Insoluble in water; soluble in PVM naphtha, benzol, carbon tetrachloride, acetone, methanol, butyl acetate. Victor Chemical Works.

PALMALENE

Palm fatty acid of medium titre, synthetically made. Commercially available. Saponification no., 180-185; Iodine value, 55-60; Titre, 35. Suggested uses: Textiles specialties, soap making, alkyl resins, polishes, wetting agents, cosmetics, rubber compounding, kier assistants, driers, and pulp and paper manufacture. The Beacon Co.

PENICILLIN

Is a potent antibiotic material obtained from the culture liquor of several species of the mold PENICILLIUM. As produced penicillin is a yellow powder, readily sol. in water, and other solvents. In the dry form it is relatively stable at room temperature, but should be stored at 10° C. In solution it gradually loses its potency and solutions are rapidly inactivated by acids or alkali. It has a very low degree of toxicity and is bacteriostatic, both in vivo and in vitro, against most Gram positive, aerobic and anerobic organisms. Available as calcium and sodium salts. 100,000 and 200,000 unit vials, and bulk dried material. Chas. Pfizer & Co.

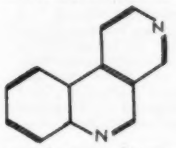
PENTANEDIONE-2, 4

(Acetyl Acetone)

$CH_3COCH_2COCH_3$. Mol. Wt., 100.1. Sp. Gr., 0.9753 @ 20/20°C. R. I., 1.4504 nD @ 20°C. Vapor pressure, 7.0 mm. @ 20°C. B. P., 140.5°Cfl (760 mm. Hg.). Melting pt., −23.5°C. Flash pt., 110°F. Sol. in water, 16.6% by wt. @ 20°C. Sol. of water in it, 5.4% by wt. @ 20°C. Clear liquid with mild ketone-like odor. Completely miscible with most organic solvents. Reacts with many metallic salts to form stable metallo-organic co-ordinate compounds that are soluble in hydrocarbons. Some of these salts may be distilled, providing possible methods for the isolation or separation of metals. Valuable intermediate for the preparation of many dyestuffs, pharmaceuticals, plasticizers, insecticides,

resin stabilizers, and corrosion inhibitors. Available in commercial quantities. Carbide and Carbon Chemicals Corporation.

m-PHENANTHROLINE

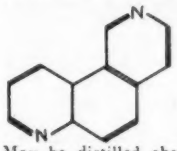


Mol. Wt. 180. Dihydrate, needles, M. P. 65.5°. Anhydrous base, M. P. 78°, B. P. above 360°. Soluble EtOH, hot water, insoluble in ether, benzene ligroin. Suggested uses: Intermediate for pharmaceuticals, dyes. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

M-PHENANTHROLINE DI-N-OXIDE

$C_{12}H_8N_2O_2$. Mol. Wt. 312. Fine yellow needles (from water). M. P. 192° C.; soluble in hot water, hot alcohol; insoluble in cold water, alcohol, and most organic solvents. Suggested uses: Chemical intermediate. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

p-PHENANTHROLINE



Mol. Wt. 180°. Needles from water. M. P. (anhydrous) 172°, sublimes above 100°C. Soluble ethanol, chloroform, benzene; slightly soluble in hot water, ether, carbon disulfide. May be distilled above 360°. Suggested uses: Intermediate for dyes pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

p-PHENANTHROLINE DI-N-OXIDE

$C_{12}H_8N_2O_2$. Mol. Wt. 312. Yellow needles (from water); M. P. 308°, soluble in boiling water; insoluble in most organic solvents. Suggested uses: Chemical intermediate. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

dl-PHENYLALANINE

$C_6H_5CH_2CH(NH_2)COOH$. Mol. Wt., 165. Glistening, colorless and odorless plates, tasteless or with faintly sweetish taste. M. P., 275-280° (sealed capillary). Less than 0.5% moisture, less than 0.1% ash. Rotation, 0. Slightly soluble in cold water or alcohol, moderately soluble in hot water, readily soluble in mineral acids or dilute sodium hydroxide. One of the essential amino acids. Winthrop Chemical Co., Inc.

PHENYL CYCLOHEXANE

$C_6H_5C_6H_{11}$. Clear mobile liquid. Aromatic odor. Freezing Point, 4.8° C.; Sp. Gr., 0.935 @ 25°/15.6° C.; R. I., 1.5205 @ 25° C.; Dist. Range, 5 to 95% between 239-241° C. (corr.). Flash Point, 210° F.; Flame Point, 220° F. Viscosity, 31.2 S.U.S. @ 100° F. Insol. in water; sol. in organic solvents. Suggested uses: High-boiling solvent, plasticizer, intermediate for syntheses, dielectric. Monsanto Chemical Co.

PHENYL DIGLYCOL CARBONATE

$(C_6H_5OCO_2C_2H_4)_2O$. Mol. Wt., 346.3; Sp. Gr., 20/4, 1.232 (supercooled liquid); R. I., $n_{20}D$, 1.5254 (supercooled liquid); B. P., 225-229° C. at 2 mm. Hg; M. P., 39-40° C.; Viscosity at 50° C., 72.4 centipoises; Flash Point, 460° F. Volatility at 100° C., 0.026 mg. loss per sq. cm. per hr. Surface Tension of supercooled liquid at 20° C., 23.0 dynes per cm. Sol. in water at 25° C., less than 0.01% by weight. Very stable to hydrolysis by water. Yields diethylene glycol, phenol, and carbon dioxide when hydrolyzed. Soluble in many organic solvents, and compatible with many resins and polymers. Odor, practically none. Suggested uses: As a plasticizer, high boiling solvent, or softening agent and in pharmaceutical and lubricant compositions. Available in commercial quantities. Columbia Chemical Division, Pittsburgh Plate Glass Company.

p-(∝-PHENYLETHYL) PHENOL

$(C_6H_5CHCH_3)C_6H_4OH$. Mol. Wt., 198.25. Sp. Gr., 1.086 @ 27°/15°C. R. I., 1.5901 @ 25°C. B. P., 312°C. @ 760 mm. Sl. sol. in hot water, sol. in alcohol. Odor, slightly phenolic. Colorless mobile liquid. Chemical properties: Undergoes the characteristic reaction of phenols with an ortho and para position unsubstituted. The hydrogen on the carbon attached to the beneze rings is also more reactive than would be normally expected. Suggested uses: Synthesis of materials for use in dyes, pharmaceuticals, pesticides, resins and other organic chemicals. Also useful as a plasticizer for cellulose derivatives. Available in experimental quantities. The Neville Company.

o-(∝-PHENYLETHYL) PHENOL

$p(C_6H_5CHCH_3)\ C_6H_4OH$. Mol. Wt., 198.25. R. I., 1.5919 @ 25°C. B. P., 325°C. @ 760 mm. M. P., 57°C. Sl. sol. in hot water, sol. in alcohol Odor slightly phenolic. Colorless crystals. Chemical properties: Undergoes the characteristic reactions of phenols with the ortho positions unsubstituted. The hydrogen on the carbon attached to the benzene ring is also more reactive than would be normally expected. Suggested uses: Synthesis of materials for use in dyes, pharmaceuticals, pesticides, resins and other organic chemicals. Also useful as a plasticizer for cellulose derivatives. Available in experimental quantities. The Neville Company.

bis (∝-PHENYLETHYL) PHENOL

$(C_6H_5CHCH_3)_2\ C_6H_3OH$. Mol. Wt., 302.39. Sp. Gr., 1.075 @ 35°/15°C. R. I., 1.6019 @ 25°C. B. P., 387°C. @ 760 mm. Insol. in water, sol. in alcohol. Odor very slightly phenolic. Color, water white viscous liquid. Chemical properties: Undergoes the characteristic reactions of disubstituted phenols. The hydrogens on the carbon atoms attached to the benzene rings are more reactive than would be normally expected. Suggested uses: Synthesis of materials for use in dyes, pharmaceuticals, pesticides, resins and other organic chemicals. Also useful as a plasticizer for cellulose derivatives. Available in experimental quantities. The Neville Company.

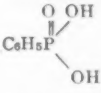
2,4,6-tris (∝-PHENYLETHYL) PHENOL

$(C_6H_5CHCH_3)_3\ C_6H_2OH$. Mol. Wt., 406.53. Sp. Gr., 1.060 @ 35°/15°C. R. I., 1.6050 @ 25°C. B. P., 404°C. @ 760 mm. Insol. in water, sol. in alcohol. Odor, very slightly phenolic. Colorless viscous liquid. Chemical properties: Undergoes the characteristic reactions of phenols with the ortho and para positions completely reacted. The hydrogens on the carbon atoms attached to the benzene rings are more reactive than would be normally expected. Suggested uses: Synthesis of materials for use in dyes, pharmaceuticals, pesticides, resins and other organic chemicals. Also useful as a plasticizer for cellulose derivatives. Available in experimental quantities. The Neville Company.

PHENYLPHOSPHINIC ACID

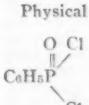
Physical State, crystals, white. Mol. Wt., 142. Solubility: Sl. sol. in ether; sol. in water and alcohol. M. P., 81-82° C. Chemical properties: Stable in air. Strong monobasic acid. Forms inorganic salts. Trivalent phosphorus oxidizes to phenlyphosphonic acid with ordinary oxidation agents. Suggested uses: General antioxidant organic amine salts as lubricating oil-additive and anti-oxidants for rubber. Acid catalyst for urea-formaldehyde type resin. Heavy metal salts as disinfectants. Improves fastness of dyed cellulose to light. Soap preservative. Victor Chemical Works.

PHENYLPHOSPHONIC ACID



Physical state, Crystals, white. Mol. Wt., 158. Sp. Gr., 1.475 at 4° C. Solubility: insol. in benzene, sol. in alcohol, ether, water. M. P., 158° C. Chemical properties: Stable in air; strong dibasic acid; forms inorganic salts. Suggested uses: Intermediate for metallic salts. The heavy metal salts may be used as antifouling agent in paint, seed disinfectants, and oxidation catalysts. Organic amine salts may be used as extreme pressure lubricant additive. The acid may improve fastness of dyed cellulose to light; retard development of color in molasses. Catalyst for hardening of urea-formaldehyde and related resins. Victor Chemical Works.

PHENYLPHOSPHORUS OXYDICHLORIDE

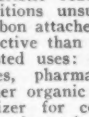


Physical state, liquid, colorless, slight fruity odor. Mol. Wt., 195. Sp. Gr., 1.375 at 20° C. B. P., 258° C. Sol. in carbon tetrachloride, benzene, chloroform, and common inert organic solvents. Chemical properties: Two reactive chlorine atoms capable of reacting with alcohols, phenols, and amines to form the corresponding esters and amides. Hydrolyzes in water to form phenylphosphonic acid. Suggested uses: Intermediate for organic synthesis. Plasticizer and oil-additive intermediate. Victor Chemical Works.

PHENYLPHOSPHORUS DICHLORIDE

Physical state, liquid, colorless to light yellow, unpleasant phosphinic odor. Mol. Wt., 179. Sp. Gr., 1.319 at 20° C. B. P., 224.6° C. Sol. in common inert organic solvents. Chemical properties: Fumes in air. Hydrolyzes in water to form phenylphosphinic acid. Two reactive chlorine atoms capable of reacting with alcohols, phenols, amines, and aldehydes. Adds oxygen, sulfur and halogens. Suggested uses: Intermediate for organic synthesis. Preparation of phosphinic acid derivatives. Anti-oxidant intermediate. Oil-additive. Victor Chemical Works.

PHENYLPHOSPHORUS THIODICHLORIDE



Physical State, liquid, colorless, aromatic. Mol. Wt., 211. Sp. Gr., 1.376 at 13° C. B. P., 205° C. (130 mm.). Sol. in common inert organic solvents. Chemical properties: Decomposes slowly in water. Two reactive chlorine atoms capable of reacting with alcohols, phenols, amines to form the corresponding neutral esters and amides. Suggested uses: Intermediate for organic synthesis. Extreme pressure lubricant additive. Plasticizer intermediate. Victor Chemical Works.

PHENYL TRIMETHYL AMMONIUM HYDROXIDE

$C_6H_5(CH_3)_3NOH$, 19-20%; H_2O, 81-80%. Sp. Gr., 1.06 @ 20° C. for 20% solution. Strong alkali, very corrosive, rapid disintegration of cellulose. Freezing Point, indeterminate (below —20° C.). Stable below 30° C. @ concentrations up to 20%. Wt. per gal., 8.8 lbs. Non-inflammable. Color: Straw yellow to light orange. Burns skin in exactly the same manner as any strong alkali. Suggested uses: Neutralizer of acids where solubility of the product salt in polar organic solvents is desired, and as a strong organic alkali for the manufacture of organic salts, e. g., silicates. Availability: Experimental quantities. Monsanto Chemical Co.

PHLOROGLUCINOL CARBOXYLIC ACID

$C_7H_6O_6$. Mol. wt., 170.01. Loses carbon dioxide at 100° to form phloroglucinol. Sol. in water. The compound may find use in resinous compositions, in the dyestuff field, and in various specialty fields. Availability: Made up to order. The Edwal Laboratories, Inc.

P. H. MEUFA

Partially hydrogenated methyl esters of 18-carbon unsaturated fatty acids. Yellow mobile liquid. Iodine number, 86; Acid number, 8; Saponification number, 176; Unsaponifiables, 6%. Insol. in water, miscible with most organic solvents. Suggested uses: Plasticizers, textile lubricant. Monsanto Chemical Co.

PINAPEROL
(Iso Butyl Furyl Propionate)

Used in flavor and perfume work. It imparts a pineapple-like aroma. In flavor work it combines well with Allyl Caproate. General Drug Co.

PLASMOQUINE DI-N-OXIDE-METHYLENE-BIS-HYDROXYNAPHTHOATE

$C_{19}H_{20}N_2O_3 \cdot C_{23}H_{16}O_6$. Mol. Wt. 735.5. Smal yellow prisms (from dilute acetone); M. P. 278-280° dec. Suggested uses: Specific antimalarial drug. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

POLYCHLORO METATERPHENYL

Crude: grayish, friable, crystalline solid. Distilled: yellow-tinted, white crystalline powder. Variable properties, depending upon degree of chlorination. Highly chlorinated product (67-68% Cl_2) crystallizes @ 230-260° C. and, at 3 mm. absolute pressure, distills in the range of 330-380° C. (Dec. below b. p. at atm. pressure.) Suggested uses: Fire retardant for paints, modification of waxes and resins. Monsanto Chemical Co.

POLYETHYL-POLYISOPROPYL BIPHENYL

A mixture of ethyl-isopropyl biphenyls. Very viscous yellow oil. Sp. Gr., 0.892 @ 65° C.; R. I., 1.5359 @ 25° C. Viscosity, 3136 S.U.S. @ 130° F. and 127.1 S.U.S. @ 210° F. Pour Point, 20° C. Insol. in water; sol. in organic solvents. Suggested uses: Plasticizer, dielectric. Monsanto Chemical Co.

POLYISOPROPYLBIPHENYL

A mixture of isopropyl biphenyls. Viscous yellow oil. Sp. Gr., 0.941 @ 25° C.; R. I., 1.552@ 25° C. Viscosity, 133.0 S.U.S. @ 100° F. and 37.8 S.U.S. @ 210° F. Pour Point, 26° F. Resistivity, 1060 10 ohms cm. @ 100° C. Dielectric Constant, 2.32 @ 100° C. Insol. in water; sol. in organic solvents. Suggested uses: Plasticizer and dielectric. Monsanto Chemical Co.

POTASSIUM AMMONIUM SULFATE

KNH_4SO_4. Mol. Wt. 143.19. White crystals. Soluble in water. City Chemical Corp.

POTASSIUM COBALTICYANIDE

$K_3Co(CN)_6$ Mol. Wt. 332.34. Yellow crystals. Soluble in water, insoluble in alcohol. City Chemical Corp.

POTASSIUM COBALTINITRATE

$K_3Co(NO_2)_6 \cdot H_2O$. Mol. Wt. 566.19. Pink crystals. Soluble in water. City Chemical Corp.

POTASSIUM FUROATE

C_4H_3OCOOK. Mol. Wt., 150.13. White crystalline powder. Very soluble in water. City Chemical Corp.

POTASSIUM GLUCONATE

$C_5H_6(OH)_5COOK$. Mol. Wt. 234.25. White crystalline powder. Very soluble in water. City Chemical Corp.

2-PROPANOLPYRIDINE

Available in 95% pure grade. Suggested uses: In manufacture of pharmaceuticals, dyestuffs, rubber accelerators, fungicides, insecticides, disinfectants, wetting agents, plastics and inhibitors. Reilly Tar & Chemical Corp.

4-PROANOLYPYRIDINE

Available in 95% pure grade. Suggested uses: In manufacture of pharmaceuticals, dyestuffs, rubber accelerators, fungicides, insecticides, disinfectants, wetting agents, plastics and inhibitors. Reilly Tar & Chemical Corp.

PROPYLAMINE

$CH_3CH_2CH_2NH_2$. Mol. Wt., 59.1. B. Range, 46-51°C. Sp. Gr. at 20/20°C., 0.717. R. I. $N^{20}D$, 1.389. Flash Pt., <20°F. Water-white liquid sol. in water, ethanol, benzene and most organic solvents. Uses: Possible raw material in synthesis of pharmaceuticals, dyestuffs, textile assistants, emulsifying agents, inhibitors, antioxidants and rubber chemicals. Available in experimental quantities. Sharples Chemicals Inc.

PROPYLENE GLYCOL MONOCOCATE C (Edible)

$RCOOCH_2CHOHCH_3$. Mol. Wt., 265. Edible propylene glycol monoester of cocoanut fatty acids. Density (20° C.), 0.92; R. I., 1.44; M. P. (open tube), 3-4° C.; pH of 10% dispersion, 6.9. Liquid with light lemon tint. Fatty odor, slight taste. Composition: Propylene glycol monocacate, 85%. Chemical constants: Iodine value, 6%. Insol. in water; very sol. many organic solvents including vegetable oils. Suggested uses: Fat-soluble blending, stabilizing, dispersing, solubilizing plasticizing, lubricating agent in cosmetic and technical emulsions, food, plastics, rubber, protective coatings, insecticidal sprays (excellent solvent for DDT), textiles. Colgate-Palmolive-Peet Co., Organic Chemicals Division.

PROPYLENE GLYCOL MONOLAURATE P (Edible)

$RCOOCH_2CHOHCH_3$. Mol. Wt., 258. Edible propylene glycol monoester of lauric acid. Density (20° C.), 0.92; R. I., 1.44; M. P. (open tube), -1° C. to 0° C.; pH of 10% dispersion, 6.9. Light colored liquid, fatty odor, practically tasteless. Composition: Propylene glycol monococate, 85%. Chemical constants: Iodine value, less than 0.5%; free fatty acid less than 0.2%. Insol. in water; very sol. in many organic solvents including vegetable oils. Suggested uses: Fat-soluble blending, stabilizing, dispersing, solubilizing, plasticizing and lubricating agent in cosmetic and technical emulsions, food, plastics, rubber, protective coatings, insecticidal sprays. Colgate-Palmolive-Peet Co., Organic Chemicals Division.

PROPYLENE GLYCOL MONOSTEARATE C (Edible)

$RCOOCH_2CHOHCH_3$. Mol. Wt., 328. Edible propylene glycol monoester of stearic acid. Density: liquid (50° C.), 0.88; solid (20° C.), 0.95. M. P. (open tube), 35-36° C.; pH of 10% dispersion, 7.0. White waxy solid. Tasteless, odorless. Composition: Propylene glycol mono"stearate," 83%. Chemical constants: Iodine value, 4,5%. Insol. water, sol. many organic solvents including vegetable oils. Suggested uses: Fat-soluble blending, plasticizing, dispersing, stabilizing agent in cosmetic and technical emulsions, food, plastics, rubber, protective coatings (paints, paper, metals), textiles. Colgate-Palmolive-Peet Co., Organic Chemicals Division.

PROPYLENE GLYCOL MONOSTEARATE H (Edible)

$RCOOCH_2CHOHCH_3$. Mol. Wt., 334. Edible propylene glycol monoester of hydrogenated tallow fatty acids. Density: liquid (50° C.), 0.84; solid (20° C.), 0.96. M. P. (open tube), 39-40° C.; pH of 10% dispersion, 7.1. White wax-like solid. Tasteless, odorless. Composition: Propylene glycol mono"stearate," Insol. water; sol. many organic solvents including vegetable oils. Suggested uses: Fat-soluble 82%. Chemical constants: Iodine value, 1.0%. blending, plasticizing, dispersing, stabilizing agent in cosmetic and technical emulsions, food, plastics, rubber, textiles, protective coatings (paints, paper, metals). Colgate-Palmolive-Peet Co., Organic Chemicals Division.

PROPYLENE GLYCOL OLEATE

Non-emulsifiable, pale yellow liquid. B. P., 210° C. (25mm). Suggested uses: As plasticizer and lubricant; in cosmetics, pharmaceutical and textile industries. The Beacon Co.

PROPYL PHOSPHORIC ACID

Mixture of $(C_3H_7)H_2PO_4$ and $(C_3H_7)_2HPO_4$. Light amber-colored liquid. 97% acids. Sp. Gr., 1.24 @ 25° C. Water sol. Monsanto Chemical Co.

PYRENE

B. P., approximately 393° C.; Fr. P., 145° C. minimum; insol. in water; sol. in most c mmon organic solvents, including ethers, ketones, esters, aliphatic and aromatic hydrocarbons, and chlorinated aliphatic and aromatic hydrocarbons; sl. sol. in alcohols. Suggested uses: In the manufacture of intermediates for dyes, in the preparation of fluorescent coloring agents for oils, and in the synthesis of organic chemicals. Reilly Tar & Chemical Corp.

SANTICIZER 3 (N-Ethyl para-Toluene Sulfonamide)

$CH_3C_6H_4SO_2NHC_2H_5$. White solid. Mol. Wt., 199.26. Odor: slight, characteristic. M. P., approximately 60° C.; R. I., approximately 1.522 @ 65° C. Acidity, 0.1% max. (as acetic acid). Sp. Gr., approximately 1.171 @ 65°/65° C. Compatible with cellulose acetate. Has limited compatibility with cellulose nitrate (lacquer grade), ethyl cellulose, cellulose acetate-propionate, cellulose acetate-butyrate, polyvinyl formal and polyamide resins. Santicizer 3 is a sulfonamide type plasticizer, solid at ordinary temperatures. It is similar to Santicizer 8 (N-ethyl o,p-toluene sulfonamide) except that it is only the para isomer. It is of value in conjunction with other plasticizers to impart high gloss, toughness and hardness. There is some indication it can be used to sharpen the softening point of some thermoplastic compositions. Availability: Commercial quantities. Monsanto Chemical Co.

SANTICIZER 130 (N-Isopropyl Benzene Sulfonamide)

Clear, practically colorless liquid. Odor: very slightly fruity. Crystallizing Point, about 26-27° C. under some conditions, supercools readily; Sp. Gr., approximately 1.176 @ 25°/25° C., Viscosity: At 45° C., 50 centopoises; at 25° C., 140 centipoises; at 5° C., 3620 centipoises. Acidity, not over 0.02% (as H_2SO_4). Compatible with cellulose acetate, cellulose nitrate (lacquer grade), cellulose aceetate-propionate, cellulose acetate-butyrate, ethyl cellulose, polyvinyl acetate, polyvinyl formal, polyvinyl butyral, polystyrene, phenolics, polyamide resins and zein. It is also compatible with most natural and synthetic resins normally used in the protective coating industry. Santicizer 130 is an excellent plasticizer, imparting toughness, high gloss and good flow. Improves transparency of paper coatings. Santicizer 130 is a sulfonamide type plasticizer similar to Santicizer 8 (N-Ethyl o,p-toluene sulfonamide) but has a wider range of compatibility with better initial color and is more uniformly stable under heat. Availability: Limited commercial quantities. Monsanto Chemical Co.

SANTICIZER 131 (N-Isopropyl Benzene Toluene Sulfonamide)

Clear, practically colorless liquid. Odor: Very slightly fruity. Crystallizing Point, becomes a glass-like solid at — 30° C. Acidity, not over 0.02% (as H_2SO_4). Sp. Gr., approximately 1.170 @ 25°/25° C. Compatible with cellulose acetate, cellulose nitrate, cellulose acetate-propionate, cellulose acetate-butyrate, etyl cellulose, polyvinyl acetate, polyvinyl formal, polyvinyl butyral, polystyrene, phenolics, polyamide resins and zein. It is also compatible with most natural and synthetic resins normally used in the protective coating industry. Santicizer 131 is a sulfonamide type plasticizer similar to Santicizer 8 (N-ethyl o,p-toluene sulfonamide). However, it has a wider range of compatibility with better initial color and is more uniformly stable under heat. Santicizer 131 is an excellent plasticizer imparting toughness, high gloss, and good flow. Improves transparency of paper coatings. Availability: Commercial quantities. Monsanto Chemical Co.

SANTICIZER 140 (Phenyl Cresyl Phosphate)

Essentially colorless liquid. Essentially odorless. Sp. Gr., approximately 1.208 @ 25°/25° C. Acidity, not over 0.01% (as H_3PO_4). Compatible with cellulose acetate (20-25 parts), cellulose nitrate, ethyl cellulose, cellulose acetate-propionate, cellulose acetate-butyrate, polyvinyl formal, polyvinyl butyral, polyvinyl chloride and polyvinyl chloride-acetate. A mixed phenyl cresyl phosphate similar to tricresyl phosphate in most respects, including fire retardant properties. Important differences are somewhat better solvent action and improved low temperature flexibility in polyvinyl chloride and copolymers. Applicable to the same base plastics, the same type of compositions and the same general uses as tricresyl phosphate. Availability: Commercial quantities. Monsanto Chemical Co.

SELENIOUS ACID, C.P.

H_2SeO_3. Mol. Wt. 128.98. White to greenish-white crystals. Very soluble in water, alcohol. City Chemical Corp.

SILVER BICHROMATE

$Ag_2Cr_2O_7$. Mol. Wt. 431.78. Red crystalline powder. Slightly soluble in cold water, decomposes in hot water, soluble in acids and ammonium hydroxide. City Chemical Corp.

SILVER CYANATE

AgOCN. Mo. Wt. 149.90. White crystal powder. Slightly soluble in cold water. Soluble in hot water. Soluble in HNO_3 and NH_4OH. City Chemical Corp.

SILVER SULFITE

Ag_2SO_3. Mol. Wt. 295.82. White crystalline powder. Slightly soluble in water, soluble in acids, ammonium hydroxide, KCN. Insoluble in HNO_3. City Chemical Corp.

SILVER THIOCYANATE

AgCNS. Mol. Wt. 165.96. White powder. Insoluble in water, soluble in ammonium hydroxide. City Chemical Corp.

SODIUM ACID SELENITE

$NaHSeO_3$. Mol. Wt. 150.96. White, deliquescent crystals. Soluble in water. City Chemical Corp.

SODIUM DIBUTYLDITHIOCARBAMATE

$(C_4H_9)_2NCS_2Na$. Mol. Wt., 227.4. Sp. Gr. at 20/20°C., 1.10. M. Range, 98-121°C. Gray solid with faint amine odor, sol. in water, methanol, benzene and most organic solvents. Uses: Analytical reagent, synthesis of insecticides and rubber vulcanization accelerators. Available in commercial quantities. Sharples Chemicals Inc.

SODIUM DIETHYLDITHIOCARBAMATE

$(C_2H_5)_2NCS_2Na$. Mol. Wt., 171.3. M. Range, 99-101°C. White, odorless solid. Uses: analytical reagent, synthesis of insecticides, pharmaceuticals and rubber vulcanization accelerators. Available in commercial quantities. Sharples Chemicals Inc.

SODIUM ETHYLENE Bis-N-Beta CYANOETHYL DITHIOCARBAMATE

Yellow resin containing 79-83% anhydrous salt and water. Very sol. in H_2O and alcohol. Very sl. sol. or insol. in C_6H_6 and naphtha. Uses: Insecticide and fungicide. Monsanto Chemical Co.

SODIUM HYDRIDE

NaH. Mol. Wt., 24.005. M. P., Decomposes at moderately elevated temperatures to give hydrogen and molten sodium. Grayish-white, crystalline free-flowing powder. Suggested uses: As catalyst for ester-ester condensations, aldehyde-ester condensations, ketone-ester condensa-

tions; preparation of sodium derivatives of unsaturated alcohols and other organic compounds; hydrogenation catalyst for partial reduction of polynuclear aromatic hydrocarbons. Reduction of metal oxides to metals. Available in limited quantities. E. I. du Pont de Nemours & Co., Inc.

SODIUM SULFATO PHOSPHATE

$Na_2SO_4 \cdot HPO_3 \cdot H_2O$. Hygroscopic, white granular powder. Typical analysis: P_2O_5, 29.76; SO_3, 32.04. Suggested use: As an acidulant in powdered soft drinks. Monsanto Chemical Co.

SODIUM TRIMETAPHOSPHATE

$(NaPO_3)_3$. White powder. Neutral, water-soluble salt. Non-hygroscopic. Monsanto Chemical Co.

SODIUM TRIPOLYPHOSPHATE, HYDRATED

$Na_5P_3O_{10} \cdot 6H_2O$. Physical form, white, free-flowing crystals. Mol. Wt., 476; R. I. N_D, 1.453 ± .005; N_C, 1.471 ± .005. Sol. in water; pH, 9.8 at 1% concentration. Forms soluble complexes of alkaline earth and heavy metals. More freely soluble than the anhydrous form. Uses: Detergent, water softener, soap builder. Victor Chemical Works.

SODIUM URANYL CARBONATE

$2Na_2CO_3 \cdot UO_3CO_3$. Mol. Wt. 542.09. Yellow crystals. Decomposes at 400° C. Slightly soluble in water, insoluble in alcohol. City Chemical Corp.

SODIUM XYLENESULFONATE, (40% Solution)

$C_6H_3(CH_3)_2SO_3Na$. Mol. Wt., 208. Solution containing a minimum of 40% solids is a light straw colored material having a faint sweet odor. The pH of the solution varies between 7.5 and 8.5 @ 25° C.; Sp. Gr., 1.158-1.167 @ 25° C. Available in semi-commercial quantities as a 40% solution (approximate) consisting primarily of the sodium sulfonate derivatives of the 1,3 isomer with smaller amounts of the 1,2 isomer. Solutions exhibit moderate wetting properties. Suggested uses: Preparation of hydrotropic solutions. Solutions materially increase the solubility of many sparingly soluble organic and inorganic compounds in aqueous systems. Solvent extractions, mutual solvent, speeding up reactions by increasing the solubility of many slightly soluble compounds, solvent for lignin and pentosans. Available in drums containing 515 pounds net. Wyandotte Chemicals Corp.

STANNOUS ORTHO PHOSPHATE

$Sn_3(PO_4)_2$. Mol. Wt. 546.14. White powder. Insoluble in water, soluble in dilute acids. City Chemical Corp.

N-STEAROYLETHYLENEDIAMINE

$H_2NCH_2CH_2NHCOC_{17}H_{35}$. Mol. Wt. 326. White crystals (from acetone). M. P. 103°. Soluble in water. Suggested uses: Detergent, wax. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

STRONTIUM GLYCEROPHOSPHATE

$SrC_3H_7O_6P$. Mol. Wt. 257.74. White powder. Slightly soluble in water, insoluble in alcohol. City Chemical Corp.

STRONTIUM METAPHOSPHATE

$Sr(PO_3)_2$. Gray powder. Insol. in water. Suggested uses: Constituent of glasses, porcelains and enamels. Monsanto Chemical Co.

Meta-SULFOBENZOIC ACID

$C_6H_4(SO_3H)(COOH)$. Light gray, crystalline solid. M. P., approximately 140° C. Very hygroscopic and water sol.; forms dihydrate. Strong acid. Very easily esterified on the carboxyl group. Suggested uses: Intermediate for chemical synthesis. Availability: Pilot plant quantities. Monsanto Chemical Co.

TETRABUTYLUREA

$(C_4H_9)_2NCON(C_4H_9)_2$. Mol. Wt., 284.5. M. P., -60°C. B. Rnge, 305-315°C. Sp. Gr. at 20/20°C., 0.877. R. I. $N^{20}D$, 1.453. Flash Pt., >200°F. Water-white, odorless liquid. Uses: Plasticizer. Available in experimental quantities. Sharples Chemicals Inc.

TETRACHLOROPHTHALIC ANHYDRIDE

$C_6Cl_4(CO)_2O$. Mol. Wt., 285.9. Chlorine content, 49.6%. Properties of commercial product: Purity, 99% plus; M. P., 254-255° C. (254.9 for 100% purity); B. P., approximately 362° C. (slight decomposition). Almost white odorless powder. Highly sol. in caustic alkali solutions; sol. in several organic solvents. Forms monoesters with alcohols and nearly insol. salts of several common metals. Is highly stable and chemically more inert than phthalic anhydride. Suggested uses: Intermediate or compounding material in the manufacture of dyes, pharmaceuticals, fungicides, esters, plasticizers, protective coatings, synthetic resins, synthetic rubbers, insulating materials, lubricants. Available in pilot plant quantities. Trade name: Niathal. Niagara Alkali Co.

N-n-TETRADECYLETHYLENEDIAMINE

$H_2NCH_2CH_2NHC_{14}H_{29}$. Mol. Wt. 256. White, waxy solid. M. P. 42-43°. Insoluble in water; soluble in most organic solvents. Dihydrochloride: $C_{16}H_{36}N_2 \cdot 2HCl$. Mol. Wt. 329. Prisms from alcohol. M. P. 198-199° dec. Suggested uses: Detergent, intermediate. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

Tert-TETRADECYL MERCAPTAN

$C_{14}H_{29}SH$. Sp. Gr., 0.88 @ 60/60° F. B. P. 254-266° C. Purity 86% (hydrocarbon impurity). Suggested uses: organic synthesis; pharmaceuticals, insecticides, fungicides, solvent, polymerization modifiers and as an additive in rubber and plastics. Available in experimental quantities. Phillips Petroleum Co.

TETRAETHYLTHIURAM SULFIDE

$[(C_2H_5)_2NC:S]_2S$. Mol. Wt., 264.0. Sp. Gr. at 20/20°C., 1.12. B. Range, 255-240 at 3 mm. Hg. Color, dark brown. Liquid or low melting solid. Uses: Formulation of pesticides and pharmaceutical preparations. Available in commercial quantities. Sharples Chemicals Inc.

TETRAHYDROFURAN

$CH_2CH_2CH_2CH_2$ (ring with O) Mol. Wt., 72.06. M. P., -65°C. at 760 mm. Sp. Gr., 0.888 at 20°/4°C. Colorless mobile liquid with ether-like odor. Completely miscible with water and most common organic solvents. Suggested uses: Solvent; preparation of butadiene, succinic acid, halohydrins, dihalides, pyrrolidine, tetrahydrothiophene and 1,4 di-substituted butane derivatives. Available in limited quantities. E. I. du Pont de Nemours & Co., Inc.

TETRALEAD PYROPHOSPHATE

$Pb_2P_2O_7$. White powder. Insol. in water. Suggested uses: As a pigment for white paints. Has a high index of refraction and good hiding properties. Paints prepared from it give a very white dried film, which is quite desirable since most lead pigments tend to produce yellowing in the dried film. Monsanto Chemical Co.

TETRAOXY-p-PHENYLENEDIAMINE HYDROCHLORIDE

$(OH)_4(NH_2)_2C_6 \cdot 2HCl$. Mol. Wt. 245. Long, colorless needles (from water and dilute hydrochloric acid). Suggested uses: Intermediate for drugs and dyestuffs. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

THIOACETAMIDE

Colorless crystals. M. P., 108-111° C. Very sol. in H_2O, C_2H_5OH, butyl alcohol, acetone, and ethyl acetate; sl. sol. in ether, C_6H_6, chlorobenzene, and $CHCl_3$; very sl. sol. or insol. in naphtha. Uses: Preservative for oranges and lemons. Monsanto Chemical Co.

THIOGLYCOLLAMIDE

$HSCH_2CONH_2$. Mol. Wt., 91.13. White needles having a disagreeable odor. M. P., 52°. Freely sol. in water and alcohol; easily oxidized in air to dithiodiglycolldiamide. Suggested uses: Used in the preparation of various salts, such as the bismuth and antimony salts which are valuable in the biological field. Martin Labs.

THIOVANOL (Al-ha-Monothiog'ycerol)

$HOCH_2CHOHCH_2SH$. Mol. Wt. 108.1. Sp. gr. 1.2455 @ 20°/4° C. Refractive index 1.5268 @ 20° C. B. P. 112° C. (3 mm.) Completely miscible with water and alcohol. Colorless to light yellow viscous liquid. Vacuum-distilled. Suggested uses: Permanent waving, depilatory, reducing agent, antioxidant. Available in commercial quantities. Evans Chemetics, Inc.

TITANIUM NITRATE

Approx. $5TiO_2 \cdot N_2O_5 \cdot 6H_2O$. Mol. Wt. 615.6. White crystalline powder. Decomposed by water. City Chemical Corp.

6-TOSYLAMINOQUINOLINE [6-(p-Toluenesulfonamido)quinoline]

$CH_3C_6H_4SO_2NHC_9H_6N$. Mol. Wt. 298. White crystals from alcohol, M. P. 195°. Suggested uses: Intermediate for dyes and pharmaceuticals. Available only in small quantities for experimental investigation. Evans Chemetics, Inc.

1, 3, 5-TRIAMINOBENZENE

$C_6H_9N_3$. Mol. Wt., 123.16; M. P., 129° C. when anhydrous. White to gray crystals. Sol. in water and alcohol, insol. in ether. Hydrochloride very sol. in water, little sol. in alcohol: Uses: This third member of the series aniline, meta-phenylenediamine, should find wide use in organic syntheses, particularly in the dye, resin, antioxidant, and pharmaceutical fields. Availability: Trihydrochloride available in small quantities from stock. Larger quantities of the trihydrochloride salt and the base are made up to special order. The Edwal Laboratories, Inc.

2, 4, 6-TRIAMINOTOLUENE

$C_7H_{11}N_3$. Mol. Wt., 137.18; M. P., 122° C. Tan powder. Sol. in water and alcohol, sparingly sol. in chloroform, nearly insol. in ether. Hydrochloride is extremely sol. in water, little sol. in alcohol. Uses: This third member of the series toluidine, meta-toluylenediamine, should find wide use in organic syntheses, particularly in the dye, resin, antioxidant and pharmaceutical fields. Availability: The trihydrochloride is available in small quantities from stock. Larger quantities of the trihydrochloride and of the base are made up to special order. The Edwal Laboratories, Inc.

TRIETHANOLAMINE ETHYL PHOSPHATE

Mixture of $(C_2H_4OH)_3N$ H $(C_2H_5)_2PO_4$ and $[(C_2H_4OH)_3NH)]_2C_6H_6PO_4$. 60% water solution: pH 6.9-7.1; Sp. Gr., 1.183 @ 25° C. Suggested uses: Water-soluble drawing compound. Monsanto Chemical Co.

TRIETHANOLAMINE PHOSPHATE

Mixture of primary and secondary salts of triethanolamine phosphate. Slightly acid. Viscous suspension. Sol. in water. Suggested uses: Oil additive. Monsanto Chemical Co.

TRIETHANOLAMINE SALT OF LAUROALKYL SULFOBENZOATE

$C_{12}H_{25}OCOC_6H_4SO_3NH(C_2H_4OH)_3$. Dark, amber-colored liquid. Sol. in water, ethanol, benzene, carbon tetrachloride. Suggested uses: Liquid detergent, shampoo formulations. Monsanto Chemical Co.

TRILEAD ORTHOPHOSPHATE

Essentially $Pb_3(PO_4)_2$. % PbO, 81.8; % P_2O_5, 18.0; % H_2O, 0.2. White dense microcrystalline powder. Insol. in water. Suggested uses: Pigment. Monsanto Chemical Co.

TRIMETHYL PHOSPHATE

Physical State, mobile liquid, colorless, clear. Mol. Wt., 140. Sp. Gr., 1.2052 (25° C.). R. I., 1.3950 (ND). Acidity, 0.1 cc 0.1 NaOH/10 cc to phenolphthalein. B. P., 89° C. (17.5 mm.); 196° C. (760 mm.). Surface Tension, 29.82 dynes/cm. (17.5° C.). Insol. in naphtha; sol. in water, alcohols, acetone, ether, toluene, carbon tetrachloride. M. P., 49° F. Viscosity, 3.6 centipoises (32° F.); 6.5 centipoises (0° F.). Suggested uses: Plasticizer; methylating agent; solvent. Victor Chemical Works.

TRIOCTYL PHOSPHATE

Physical State, Mobile liquid, straw. Mol. Wt., 434. Sp. Gr., 0.924 (26° C.). R. I., 1.442 ND). Acidity, 0.1 cc 0.1 N NaOH/10 cc phenolphthalein. B. P., 185-90° C. (3 mm.). Surface Tension, 29.2 dynes/cm. Insol. in water; sol. in toluol, alcohols, ether, acetone, butylacetate, naphtha, carbon tetrachloride. M. P., very viscous at -80° C. Flash Point, 300° F. (closed cup). Hydrolysis 0.08 cc 0.1 N NaOH/10 g/2 hrs to phenol. in 100 cc boiling water. Suggested uses: Plasticizer; solvent; anti-foaming agent; lubricant; oil-additive. Victor Chemical Works.

TRIPHENYL PHOSPHINE SULFIDE

$(C_6H_5)_3PS$. Organic phosphorus and phosphorus thio-compound. Physical state, solid,

light yellow color. Mol. Wt., 294. Acidity, neutral. Analysis, 10.5% P. B. P., above 360° C. Solubility: Insol. in water; sol. in benzol, chloroform, carbon disulfide; sl. sol. in alcohol and ether. M. P., 158° C. Suggested uses: Plasticizer; oil additive. Victor Chemical Works.

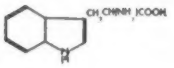
TRIOXANE

Mol. Wt., 90.05. M. P., 61-62°C. B. P., 114.5°C. at 760 mm. Sp. Gr., (molten) 1.17 at 65°/20°C. Colorless plastic crystals with pleasant characteristic odor rsembling chloroform. Sol. in alcohols, ketones, ethers, esters, chlorinated hydrocarbon solvents, aromatic hydrocarbons, and hot water; difficultly sol. in pentane and petroleum ether. Stable at ordinary temperatures. Burns with very hot, non-luminous clean odorless flame which suggests use as fuel. Suggested uses: Intermediate in organic reaction media; as source of formaldehyde with control of reaction, quality and uniformity of reaction product; plasticizer. Available in limited quantities. Commercially available in 1946. E. I. du Pont de Nemours & Co., Inc.

TRISODIUM MONOHYDROGEN PYROPHOSPHATE

$Na_2HP_2O_7$. Colorless, crystalline solid varying in water composition from the anhydrous salt to $9H_2O$. Very sol. in water, pH 1% solution, 7.4. Water softening properties about equal to tetrasodium pyrophosphate. Suggested uses: Water softener in conjunction with organic detergents. Standard buffer for pH control. Monsanto Chemical Co.

dl-TRYPTOPHANE

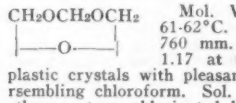


Mol. Wt., 204. Glistening, colorless and odorless plates, either tasteless or faintly sweetish taste; M. P., 285-6° (sealed capillary). Over 98% purity. Less than 0.5% moisture, negligible ash. Rotation, 0. Very sl. sol. in cold water or alcohol, moderately sol. in hot water or alcohol, readily sol. in mineral acids or dilute sodium hydroxide solution. One of the essential amino acids. Suggested for fortification of acid-treated protein hydrolysates, and other protein foods which may be deficient in tryptophane. Winthrop Chemical Co., Inc.

UNDECYLENIC ACID

$C_{10}H_{19}COOH$. B. P., 290-300. Suggested uses: Intermediate in organic synthesis. The Beacon Co.

Gamma-VALEROLACTONE (Monsanto GVL)



Mol. Wt., 100.06. Colorless liquid. Odor: Mild, musky. Crystallizing Point, — 37° C.; B. P., 205-206° C.; Sp. Gr., 1.052 @ 25°/25° C.; R. I., 1.4310 @ 25° C. Flash Point, 205° F. (Cleveland Open Cup); Fire Point, 220° F. (Cleveland Open Cup). Miscible in all proportions in water, alcohol, ether, esters, and chlorinated hydrocarbons. Insol. in aliphatic hydrocarbons. Retains excellent solvent powers when diluted with water; a dilution with as much as 75% water is an exceptional solvent for various paints, varnishes and synthetic resins. Availability: Limited commercial quantities. Monsanto Chemical Co.

dl-VALINE

$(CH_3)_2CHCH(NH_2)COOH$. Alpha-aminoisovaleric acid. Mol. Wt., 117. Glistening, colorless crystals, with no odor and a bittersweet taste. M. P., 270-271° (in special constricted tube to prevent sublimation). Sol. in water at 25°, 7%; more sol. in hot water; practically insol. in alcohol or ether. Moisture less than 0.5%; ash less than 0.1%. Optical rotation, 0. One of the essential amino acids. Winthrop Chemical Co., Inc.

2-VINYLPYRIDINE

Boils (with resinification) at about 159° C. (760 m.m.); sol. in water to the extent of about 2.5%; freely sol. in dilute aqueous acid solutions; sol. in all common organic solvents, including aromatic and aliphatic hydrocarbons, alcohols, ketones, esters. About 15% water dissolves in 2-vinylpyridine. Suggested uses: In the manufacture of synthetic elastomers, pharmaceuticals, and in organic syntheses. Reilly Tar & Chemical Corp.

1, 2, 4-XYLENOL

B. P., 226.5° C. (760 m.m.); Fr. P., 65.1° C.; available commercially in a 95% pure grade. Suggested uses: In the manufacture of pharmaceuticals, insecticides, fungicides, plasticizers, rubber chemicals, disinfectants, additives to lubricants and gasolines, photographic compounds, plastics, wetting agents, dyestuffs, and various organic syntheses. Reilly Tar & Chemical Corp.

1, 3, 4-XYLENOL

B. P., 211.3° C. (760 m.m.); Fr. P., 24.4° C.; available commercially in a 95% pure grade. Suggested uses: In the manufacture of pharmaceuticals, insecticides, fungicides, plasticizers, rubber chemicals, disinfectants, additives to lubricants and gasolines, photographic compounds, plastics, wetting agents, dyestuffs, and various organic syntheses. Reilly Tar & Chemical Corp.

1, 4, 2-XYLENOL

B. P., 211.6° C. (760 m.m.); Fr. P., 74.9° C.; available commercially in a 95% pure grade. Suggested uses: In the manufacture of pharmaceuticals, insecticides, fungicides, plasticizers, rubber chemicals, disinfectants, additives to lubricants and gasolines, photographic compounds, plastics, wetting agents, dyestuffs, and various organic syntheses. Reilly Tar & Chemical Corp.

ZINC METAPHOSPHATE

$Zn(PO_3)_2$. White powder. Melts at approximately 920° C. Has a very low thermal coefficient of exapnsion. Insol. in water. Slowly sol. in acids. Suggested uses: Constituent of glasses, porcelains and enamels. Monsanto Chemical Co.

New Chemical Specialties

ACIDOL-25A

$C_{18}H_{36}N$-HAc (approximate). Mol. Wt., 290 (average). Sol. in water, alcohol and most organic solvents. An emulsifying and foaming agent. Possesses wetting and penetrating properties. Available as a 25% aqueous solution. Industrial Division, Onyx Oil & Chemical Co.

ACRYLIC EMULSION 448-40

An acrylic copolymer emulsion which deposits a clear waterwhite tough film possessing excellent strength, flexibility, stretchability and water resistance. Recommended as a base for leather finishes, coating and impregnation of paper and textiles. Available in 30% solids, pH of 5. American Resinous Chemicals Corp.

ADHESIVE #3267

A soft light gray paste, weight 9 lbs. per gal. Pleasant odor, non-inflammable. A resin fortified starch base adhesive, reducible with water while in the liquid state. Properties: The adhesive dries with a water-resistant film that withstands 24 hours water immersion, even on non-waterproof paper. Good machining qualities on regular or transfer roll machines where the usual emulsion adhesives fail. No deterioration of bond has been found in accelerated aging tests. The product breaks "short," which is of interest for paper bag machines. Uses: Currently recommended for the manufacture of waterproof bags and cigarette cups. Other suggested uses are in the manufacture of convolute tubes and fibre containers, lamination of paper and paper board, and other combining operations where slow drying, economical, water-resistant pastes of high ultimate strength are desirable. Paisley Products, Inc.

ALDEHYDE 11-A

Related to α Amyl Cinnamic Aldehyde, but finer in aroma and stable in all types of products, whereas the former is not. For this reason it is valuable in all types of soap work and in face powder odors, particularly where a floral note is desired. General Drug Co.

ALKATERGE-C

Mol. Wt. and Equiv. Wt., approx. 350. Sp. Gr., 0.93 at 20°/20° C. Wt. per U. S. gallon, 7.77 lb. at 20° C. Coef. of cubical expansion (20° C. to 30° C.), 0.0008 per ° C. (0.0004 per ° F.). Distillation range, 194° C. to 301° C. at 3 mm. Hg. Solidification point, approx. — 36° C. Sol.: water, less than 0.002% by wt.; acetonitrile, less than 3.0% by wt.; mineral and vegetable oils, miscible; organic solvents, miscible. Heat stability, no apparent decomposition on distillation to 430° C. at atmospheric pressure. Flash Point (Cleveland open cup), 227° C. (430° F.). Shipping containers and net weights: 1-gal. bottle, 7.5 lb.; 5-gal. drum, 38 lb.; 55-gal. drum, 410 lb. Properties: A nonvolatile, cationic surface active agent. An amine type compounds which reacts with mineral acids forming salts, some of which are water sol. and produce stable foams. With higher fatty acids, it forms oil-soluble soaps which are frequently better emulsifying agents than the free base. Uses: Additive for oil and lubricants, in hydraulic oils, quenching oils, and corrosion inhibitors. Suggested as a pigment-grinding assistant and in formulating nonmetallic primer coatings, as a flotation agent for non-metallics in neutral or alkaline circuits, in the form of its salts as a penetrant in textile and paper industries, and as a component of metal cleaners. Available in drum quantities. Commercial Solvents Corporation.

ALUMINUM FOIL LAMINANT #6310

A modified synthetic resinous adhesive weighing 9.9 lbs. per gallon. This adhesive is a light creamy emulsion which produces excellent bonds on foil laminations. Properties: Produces a flexible, transparent film which is odorless, non-toxic and waterproof. Will bond aluminum foil to kraft, glassine, chipboard, cellophane and cellulose acetate. Laminations will show fibre failure after immersion in water at room temperature for one week. Uses: Manufacture of attractive and moisture vaporproof packages; waterproof aluminum foil labels. Available in steel containers from one through fifty-five gallons at our New York and Chicago plants. Paisley Products, Inc.

AMINO ACID MIXTURE FROM PROTEINS

A sulfuric acid hydrolyzed protein derived from casein and corn and wheat proteins, consisting of approximately 80-90% mixed amino acid salts, 7.5% moisture and 1.75% sodium chloride, used as a source of essential amino acids. Availability: available from stock. The Edwal Laboratories, Inc.

ARLAC DISPERSION 515-31

A high solids vinyl copolymer dispersion containing 55% solids. Deposits a clear, colorless, tough, resistant film in both fur and felt bodics. Can be used for both brim and crown stiffening by adjusting percentage solids in impregnating bath. Material remains permanent during dyeing and steaming operations. American Resinous Chemicals Corp.

AROCLOR 1221

A mixture of chlorinated biphenyl compounds, averaging 21% chlorine. Colorless, mobile oil. Sp. Gr., 1.18 @ 25° C.; Dist. Range, 275-320° C. (corr.); R. I., 1.617 @ 20° C.; Viscosity, 40 S.U.S. @ 37.8° C. Suggested uses: As a high-boiling solvent, plasticizer and dielectric. Monsanto Chemical Co.

AROCLOR 5468 MP

Mixture of polychlorinated terphenyls. White crystalline brittle solid. Chlorine content, 68% minimum; Crystallizing Range, 250-265° C.; Dist. Range, 320-400° C. at 3 mm. absolute pressure. Suggested uses: Modification of waxes and resins. Monsanto Chemical Co.

ATLAS G-1036

Mixed lauric acid ester of sorbitol polyoxyalkylene ethers and polyglycols. Light yellow liquid. Sp. Gr., 1.00 @ 25°/25°C. Setting point, −4°C. Ice-water dispersible emulsifier, spreader and wetting agent for insecticidal compositions. Sol. in most organic solvents. Excellent solvent for DDT and for rotenone and pyrethrum resins. Compatible with oils and solvents used in insecticidal sprays. An active insecticide in its own right. Cooperative insec-

ticidal action with rotenone and pyrethrum. Shipping weight, 8.5 lbs. per gallon. Supplies in 1. 5, and 55 gallon containers. Atlas Powder Company.

ATTACLAY

An adsorptive clay specially prepared for use as a carrier, diluent or spreader for active poisons in the compounding of insecticidal and fungicidal dusts and sprays. Bulk density, 27-31 lbs./cu. ft.; Sp. Gr., 2.3-2.6; Particles (under electron microscope) fibrous; pH (water extract), 7.7; free moisture, 0.2%; Chemical Analysis:

SiO_2	66.50	MgO	7.95
Fe_2O_3	3.72	CaO	3.73
Al_2O_3	11.97	Other	6.13
TiO_2	.....		

Properties: A finely divided, free flowing dust for use in compounding either the finished sprays or insecticide concentrates. Especially valuable where compounding is done by oil impregnation methods. As much as 30% of kerosene, for example, can be mixed with Attaclay without interfering with its free flowing action in the sprayers. Available in commercial quantities. Attapulgus Clay Co.

BEACOWAX CC

Hard wax, light tan color. M. P., 85-90° C. Acid No., 8. Suggested uses: Partial replacement for Carnauba wax. The Beacon Co.

BETANOL 107

Acid-stable ester. M. P., 53-56° C. White waxy solid. Sol. in wide variety of compounds, disperses easily in water. Dispersions stable over wide range of pH and in presence of metallic ions. Suggested uses: Acid emulsifiers for cosmetic and pharmaceutical creams and in the textile industry. The Beacon Co.

BETANOL 114

Acid-stable ester. M. P., 56-59° C. White waxy solid, sol. in wide variety of compounds. Disperses easily in water. Dispersions stable over wide range of pH and in presence of metallic ions. Suggested uses: Acid emulsifiers for cosmetic and pharmaceutical creams and in the textile industry. The Beacon Co.

BETANOL 152

Acid-stable hydroxy ester. M. P., 50-53° C. White waxy solid, soluble in wide variety of compounds. Disperses easily in water. Dispersions stable over wide range of pH and in presence of metallic ions. Suggested uses: Acid emulsifiers for cosmetic and pharmaceutical creams and in the textile industry. The Beacon Co.

BETANOL 564

Acid-stable hydroxy ester. Amber liquid, sol. in wide variety of compounds. Disperses easily in water. Dispersions stable over wide range of pH and in presence of metallic ions. Suggested uses: Acid emulsifiers for cosmetic and pharmaceutical creams and in the textile industry. Used in DDT emulsions. The Beacon Co.

BI-CAP FLOUR ENRICHMENT MIXTURE, TYPE A

An impalpable powder consisting of a uniform mixture of thiamin hydrochloride, riboflavin, niacin, sodium iron pyrophosphate and starch. This material is used in fortifying flour to make it meet enrichment standards. It has uniform particle size, is easily dispersed, and has free flowing properties. The mixture is light yellow in color and has a guaranteed potency (per ounce) of:

Thiamin	380 mg.
Riboflavin	230 mg.
Niacin	2740 mg.
Iron	2400 mg.

Containers—25 pound drums. Chas. Pfizer & Co.

BI-CAP FLOUR ENRICHMENT MIXTURE, TYPE B

An impalpable powder consisting of a uniform mixture of thiamin hydrochloride, riboflavin, niacin, reduced iron, and starch. This material is used in fortifying flour to make it meet enrichment standards. It has uniform particle size, is easily dispersed, and has free flowing properties. The mixture is dark gray in color and has a guaranteed potency (per ounce) of:

Thiamin	380 mg.
Riboflavin	230 mg.
Niacin	2740 mg.
Iron	2400 mg.

Containers—25 pound drums. Chas. Pfizer & Co.

BI-CAP FLOUR ENRICHMENT MIXTURE, TYPE C

An impalpable powder consisting of a uniform mixture of thiamin hydrochloride, riboflavin, niacin, reduced iron, and starch. This material is used in fortifying flour to make it meet enrichment standards. It has uniform particle size, is easily dispersed, and has free flowing properties. The mixture is dark gray in color and has a guaranteed potency (per ounce) of:

Thiamin	760 mg.
Riboflavin	460 mg.
Niacin	5480 mg.
Iron	4800 mg.

Containers—25 pound drums. Chas. Pfizer & Co.

CANVAS IMPREGNANT 451-24

A resin-modified, processed, synthetic rubber latex formulated for use in the manufacture of high speed canvas belting. Rapid and complete penetration of four ply belting may be realized on a 30-second dip. The system will cure on heat drying to bond the fibres uniformly and completely, producing a system of excellent internal strength. Surface coating systems applicable to treated and untreated canvas are available on request. American Resinous Chemicals Corp.

"CARBOWAX" COMPOUNDS 1000, 6000

$HOCH_2(CH_2OCH_2)_xCH_2OH$. Higher polyethylene glycols, waxlike solids, possessing the unique property of dissolving in water to form solutions as clear and transparent as water itself. "Carbowax" compound 1000 has an approximate molecular weight of 1000 and "Carbowax" compound 6000 has a molecular weight of approximately 6000. Both are chemically stable and non-corrosive. Sol. in many aliphatic ketones, esters, alcohols, glycol-ethers, and aromatic hydrocarbons, but solubility decreases with increasing molecular weight. Uses: superior to gums and waxes as lubricants, binders, plasticizers, or ointment bases. The two alcohol groups may be reacted with organic acids to form surface active compounds. Show promise where advantage can be taken of their solubility in water, low vapor pressure, slight hygroscopicity, and wide compatibility. Available in commercial quantities. Carbide and Carbon Chemicals Corporation.

CARNAUBA SUBSTITUTE 1320

A refined synthetic ester derived from the selective oxidation of aliphatic hydrocarbons, suitable as a Carnauba substitute in the manufacture of paste floor waxes, automobile polishes, shoe polishes and furniture polishes. M. P.: 190°F; hardness: 1; color: yellow; acid value: 2.5; sap value: 175. Cornelius Products Co.

CARNUBE WAX

Hard wax, light brown color. M. P., 80-82° C.; Acid no., 78-80. Suggested uses: Partial replacement for Carnauba Wax. The Beacon Co.

CATIONIC AMINE 220

Mol. Wt., 350. Eq. Wt., 175. B. P., 235.0°C. (1 mm.). Flash Pt., 465°F. (Open Cup). Sp. Gr. at 20/20°C., 0.9300 to 0.9360. Viscosity, 120 to 150 centipoises @ 100°F. R. I., 1.491 nD @ 20°C. Brown, high-boiling, oil-soluble liquid having strong cationic surface-active properties. Sol. in mineral oil, vegetable oils, and dilute aqueous solutions of mineral acids, and in the common organic solvents. Only sl. sol. in water. Readily emulsifies diesel oil, hydrocarbons and mineral oils, vegetable oils, and pyrethrum and phenothiazine concentrates. Useful in agricultural sprays, printing inks, and synthetic rubber polymerization. Can bring about flotation of certain minerals including barites and phosphates and shows promise as a collector in the flotation of oxidized lead ores, copper silicate, and scheelite ores. Available in limited commercial quantities. Carbide and Carbon Chemicals Corporation.

"CELLOSIZE" HYDROXYETHYL CELLULOSE WS-1000

New high-viscosity grade. Specifications on aqueous solutions: Viscosity, 900 to 1100 centipoises (Hoeppler viscosity measured as a 5 per cent solution @ 20°C.). Sp. Gr., 1.03 to 1.04 @ 20°/20°C. Concentration, not less than 7% by weight, pH range, 5.5 to 6.5. Water miscibility, complete at 20°C. Flash point, none—dried film burns less readily than paper. Forms a translucent aqueous solution, which on drying deposits a clear, transparent film that is stable to heat and light, is readily sol. in water, and insol. in practically all types of organic solvents. The film may be rendered partially water-resistant by treatment with glyoxal before drying. Compatible with other water-soluble, film-forming materials, making possible a high degree of modification. Uses: Film-forming material, sizing agent, binder, thickener, and protective colloid in aqueous dispersions; an adhesive for paper, wood, and cloth. Greaseproofing of paper and fiber containers. Carrier for the pigments and colors in dyestuff pastes for textile printing. Shipped as an 8 per cent aqueous solution. Available in drum quantities. Carbide and Carbon Chemicals Corporation.

"CELLOSIZE" HYDROXYETHYL CELLULOSE WS (Dried Form)

A dried form of "Cellosize" Hydroxyethyl Cellulose WS is available corresponding to each of the aqueous viscosity types, WS-20, WS-100, WS-500 and WS-1000. A snow-white, free-flowing powder, easily sol. in water. Depending on the viscosity type, the solutions containing more than 15-25% solids are gels. Available in limited commercial quantities. Carbide and Carbon Chemicals Corporation.

CEMENT #1705

A synthetic rubber emulsion adhesive fortified with synthetic resins to obtain tackiness and tenacity of bond. Plasticizer is incorporated to eliminate brittleness in cold temperatures. Appearance: Soft white fluid cement, weight 8½ lbs. per gal. Qualities: Forms a smooth semi-opaque, flexible film with excellent bonding properties for dissimilar materials. Can be reduced with water if desired. Can be applied to one or both surfaces and is useful for light assembly and cementing operations. Has been successfully used for adhering paper labels to frozen food cans subjected to sharp freezing. Labels hold tight after defrosting. Other uses are for combining such materials as paper, cardboard, wood, wallboard, leather, flock, fabrics, hair felt, abrasive grains, and tinsel, cork, paper to all metals, and to many coated or painted surfaces. Paisley Products, Inc.

CEREX

Thermoplastic compounds. Injection molding temperature: Cylinder, 370-450° F.; mold, 170-250° F. Sp. Gr., 1.07. Flexural strength p.s.i., 13,000. Deflection, 0.169. Distortion temp., std., 212-230° F. Burning rate, slow. Water absorption A.S.T.M. 24 hrs., 0.30%. Effect of weak acids, none; oxidizing acids attack. Clarity: Amber transparent. Color possibilities: Extensive. Should be considered for any application where injection molding is desirable but where the standard thermoplastics are unsuitable because of low heat resistance. Molded parts maintain dimensions and mechanical strength during prolonged exposure at temperatures over the boiling point of water. Suggested uses: Surgical instruments, electronic instrument parts, sterilizable combs, plumbing hardware, etc. Availability: Pilot plant quantities. Monsanto Chemical Company.

CHARCOAL, BLOOD

From Blood Albumen. Black, crystalline powder. Technical or pure grades. City Chemical Corp.

COATING DISPERSION 480-13

This system is a high solids, solvent-free aqueous dispersion developed for plastic coating. The material is formulated for knife application. After coating, the water is driven off at elevated temperatures and the coating subjected to heat and pressure to cure the film. The resulting product is a high gloss, tough, water resistant, grease and chemical resistant film possessing excellent flexibility and aging properties. It can be applied on paper, fabrics or composition board. Particularly suited for cloth where coverage in two coats is desired. Available in all colors. American Resinous Chemicals Corp.

COMBINING EMULSION BASE 396-37A

A resin emulsion base for use in adhesive compounds with concentrated buna latices. Product is non-oxidizing and the final adhesive is non-penetrating and possesses an aggressive quick grab. American Resinous Chemicals Corp.

"DEENATE" DDT INSECTICIDES

Sprays and dusts. Suggested uses: Control of insect pests of vegetables and fruits as well as livestock and buildings. E. I. du Pont de Nemours & Co., Inc.

"DEENOL" DDT INSECTICIDES

Sprays and dusts. Suggested uses: Control of insect pests. Designed for industrial applications, such as factories, railroads, canneries, pest control operators, government agencies, mosquito control commissions, etc. E. I. du Pont de Nemours & Co., Inc.

DEO-BLEND

A fortified, practically odorless, light hydrocarbon distillate with enhanced solubilizing properties for DDT. Deo-Blend will permanently hold in solution 5% of DDT, required for residual sprays, even at temperature below 0° F. L. Sonneborn Sons, Inc.

DETERGENT SANITIZER

A detergent containing a high molecular quaternary ammonium compound. A white free-flowing non-hygroscopic powder, easily soluble in water. Stable in hard water. pH of a 1% solution, 9.8. Phenol Coefficient, 6.7 against *S. aureus* and 3.1 against *E. typhosa* at 20°. Simultaneous detergent and disinfectant, especially recommended for the dairy industry. Industrial Division, Onyx Oil & Chemical Co.

DIASMOL BODY

Acetal with a green, flowery, willow-bark odor. Valuable in Jasmin compounds. Stable in presence of alkali. General Drug Co.

DIOLAMINE

Water-white amine. Combining weight, 137. Produces light-colored soaps which have excellent emulsifying properties and do not darken with age. Suggested uses: Preparation of emulsions, especially for cosmetic purposes. The Beacon Co.

DIP STRIP

These materials provide a suitable hot dip coating for protecting metal parts and tools against corrosion and abrasion. Entraps lubricants applied prior to application. When part or tool is to be used, coating may be readily removed by slitting with a knife and peeled off clean. Obtainable in clear and dark, also colors. American Resinous Chemicals Corp.

DIPWRAP

An organic thermoplastic for dip-coating metal parts. Provides a resilient, impervious, waterproof coating which can be readily peeled off. Appearance: Amber to light brown translucent. Softening Point, 250°-270° F. Dipping Temperature, 375°-390° F. Holding Temperature (idle time not to exceed 20 hrs.), 300° F. Paisley Products, Inc.

DUR-LANA

A new shrinkproofing compound for wool. It is a water dispersion of a fully polymerized synthetic resin, and can be readily applied to wool by padding or by exhaustion. Yarns or fabrics treated with DUR-LANA are exceptionally free from shrinkage and felting during subsequent launderings. An important advantage of DUR-LANA is its ease of application, and the fact that it does not require curing at elevated temperatures but may be dried at ordinary temperatures. Warwich Chemical Co.

DU PONT CUTTING COMPOUND NO. 1

A phosphorous containing liquid readily sol. in water. Sp. Gr., 1.07. Used for producing a clear aqueous cutting fluid. Concentration required 1-2% by volume in water. Shipped in 55-gallon steel drum, 475 pounds net, under non-flammable material regulations. E. I. du Pont de Nemours & Co., Inc.

DU PONT FLUOROLEUM GREEN

An oil-soluble dye in powder form used in conjunction with Du Pont Fluoroleum Red for imparting desirable green fluorescence to oils of unsatisfactory appearance. Shipped in fiber drums, 100 pounds net, under non-flammable material regulations. E. I. du Pont de Nemours & Co., Inc.

DU PONT FLUOROLEUM RED

An oil-soluble dye in powder form used in conjunction with Du Pont Fluoroleum Green for imparting desirable green fluorescence to oils of unsatisfactory appearance. Shipped in fiber drums, 100 pounds net, under non-flammable material regulations. E. I. du Pont de Nemours & Co., Inc.

DU PONT GASOLINE ANTIOXIDANT NO. 22

Disecondary - Butyl - Para - Phenylene-Diamine containing no solvent. A mobile liquid readily sol. in gasoline in all proportions and operating temperatures. Sp. Gr., 0.92. Used for reducing the formation of gum and precipitation of lead in gasoline. Concentration required 0.001%-0.004% by weight. Shipped in 55-gallon steel drums. 400 pounds net, under non-flammable material regulations. E. I. du Pont de Nemours & Co., Inc.

DU PONT RUST PREVENTIVE NO. 1

A viscous reddish-brown clear liquid, readily sol. in all proportions in mineral oil at room temperatures. Sp. Gr., 1.05. Used at concentrations of 1-5% by volume in petroleum carriers for imparting non-staining rust preventing properties. Shipped in 55-gallon steel drums, 450-pounds net, under non-flammable material regulations. E. I. du Pont de Nemours & Co., Inc.

EMCOL 3160-SPC

pH 8.5, 40% aqueous solution, clear amber viscous liquid amine soap. Profuse foamer. Uses: Shampoo base, industrial detergent, foaming agent. Emulsol Corporation.

EMCOL 3162-C

pH 8.5, 40% aqueous clear amber paste pure amine soap. Profuse foamer. Uses: Shampoo base, industrial detergent, foaming agent. Emulsol Corporation.

EMCOL 3176

pH 7.5-8.0, 30% active material, cream colored aqueous paste, synthetic sulfated derivative. Stable in hard H_2O, acids and alkalies. Uses: Soapless detergent, shampoo base, foaming agent, textile, metal and plastic cleaning. Emulsol Corporation.

EMULSIFIABLE DEO-BLEND

Modified Deo-Blend capable of holding 5% of DDT in permanent solution at temperatures about 5° F. DDT solutions in Emulsifiable Deo-Blend when added to water will form stable, milky white, non-foaming emulsions. Use for DDT emulsion sprays. L. Sonneborn Sons, Inc.

EMULSION 396-8

An emulsion adhesive base for modifying Buna Type 3 Latex. 50 parts of 396-8 to 70 parts GR-S Latex by weight produces a medium-heavy viscosity adhesive recommended for most wet-stick operations and applicable by brush or machine. Adhesive blend yields a strong, flexible bond with a minimum of penetration. American Resinous Chemicals Corp.

EMULSION 539-5

Low cost modified alkyd emulsion containing 45% solids. A resin modifier for synthetic and/or natural rubber latices. Yields adhesive compounds depositing tough resilient films possessing good tensile strength and aggressive adhesion. Yields adhesives of medium-heavy viscosity. Modifications are available where low viscosities are required and where a soft tack is preferred to an aggressive bite. American Resinous Chemicals Corp.

EMULSION 539-10

Low cost adhesive emulsion for general use. Possesses quick grab, good strength and water resistance. Viscosity is adapted for both brush and machine application. Deposited film is non-oxidizing and possesses slight thermoplastic properties. American Resinous Chemicals Corp.

EMULSION 554-11

An emulsion base for adhesive manufacturers to use with neoprene latices. Equal parts by weight of 554-11 and neoprene latex yield an adhesive of medium viscosity depositing a strong, pressure-sensitive film. Viscosity suitable for application by spray brush, spreader and roller coater. Retains cohesive tack for several days. American Resinous Chemicals Corp.

EMULSOWAX 1214

A Refined Carnauba substitute for use in self-polishing emulsion floor waxes and liquid shoe polishes. A synthetic product produced by the selective oxidation of aliphatic hydrocarbons. Produces white water-resistant, glossy and non-sticky emulsions of excellent stability and low cost. M. P.: 165° F; hardness: 1-2; color: amber; acid value: 28-30; sap. value: 105-107. Cornelius Products Co.

ESTROGENIC SUBSTANCE

A natural estrogenically active product obtained from pregnant mares' urine, showing 10,000,000 International Units per gram. Contains not less than 90% estrone, but does not meet U.S.P. standards for estrone. Availability: Commercial quantities usually from stock. The Edwal Laboratories, Inc.

ETHYLENE GLYCOL ACETAL OF CYCLAMAL

Variation of the well known Cyclamal. It is very stable in soap. It is of great value in all types of Lily of the Valley odors. General Drug Co.

EUMERCIN W

A mercerizing penetrant which is extremely effective in wetting-out cotton gray goods in 40 to 55° Tw. mercerizing baths (18 to 25% caustic content). EUMERCIN W does not separate from the bath, and its efficiency is undiminished even on prolonged standing. Warwick Chemical Co.

FIXATIVE 25-A

An acetal. Very powerful. It has a floral wavy note. General application. General Drug Co.

"FLEXOL" PLASTICIZER CS-24

Sp. Gr., 0.9856 @ 20/20°C. Vapor pressure, 2.4 mm.Hg. @ 200°C. B. P., 219°C. (5 mm.). Viscosity, 15.3 centipoises @ 20°C. Flash point, 395°F. (Open Cup). R. I., 20, 1.4387. Coeff. of expansion, 0.00085 per °C. @ 20°C.. Sol. in water, <0.01% by wt. @ 20°C. Sol. of water in it, 0.6% by wt. @ 20°C. A stable, high-boiling ester, very light in color. Develops excellent low-temperature flexibility with the vinyl resins and nitrocellulose. Uses: Plasticizer for the vinyl resins, nitrocellulose, ethyl cellulose and synthetic rubber. Available in commercial quantities. Carbide and Carbon Chemicals Corporation.

"FLEXOL" PLASTICIZER 4GO

(Polyethylene Glycol-Di-2-Ethylhexoate)

Mol. Wt., 446.6. Sp. Gr. 0.9892 @ 20/20°C. Sol. in water <0.01% by wt. @ 20°C. Sol. of water in it, 1.4% by wt. @ 20°C. Viscosity 25.1 centipoises @ 20°C. R. I., 1.447 nD @ 20°C. Flash pt., 395°F. (Open Cup). Light colored, mild-odored liquid. As plasticizer for synthetic resins and rubbers, it results in flexibility at low temperatures and possesses very low volatility. Compatible with "Vinylite" resins, polystyrene, nitrocellulose, ethyl cellulose, and methyl methacrylate resins, as well as with synthetic rubbers. Uses: Plasticizer useful in molding, calendering and extrusion compounds of the vinyl chloride and vinyl chloride-acetate resins; plasticizer for synthetic rubber, as well as for lacquers incorporating those resins with which it is compatible. Available in commercial quantities. Carbide and Carbon Chemicals Corporation.

"FLEXOL" PLASTICIZER 8N8

Sp. Gr., 0.9564 @ 20/20°C. Vapor pressure, 0.6 mm. Hg. @ 200°C. B. P., 255°C. (5 mm.). Viscosity, 139.2 centipoises @ 20°C. Flash pt., 420°F. (Open Cup). R. I., 1.4584. Coeff. of Expansion, 0.00076 per °C., @ 20°C. Sol. in water, <0.01% by wt. @ 20°C. Sol. of water in it, 0.5% by wt. @ 20°C. This very high-boiling plasticizer offers exceptional permanence and wide compatibility. Uses: Especially designed for use with the vinyl resins where other plasticizers did not meet the requirements. Also of interest to those working with cellulose derivatives and synthetic rubber. Available in limited commercial quantities. Carbide and Carbon Chemicals Corporation.

FORMASET 10

A modified urea-formaldehyde resin condensate. It is a clear, stable liquid which can be cured with the aid of catalysts to obtain durable resin finishes or to control shrinkage. Warwick Chemical Co.

GERANIUM BODY

Ketal of great persistency. Used to enhance the aroma of Oil of Geranium. Valuable in soap perfumery. General Drug Co.

GLOSSCOTE

Solvent coating for paper, glassine, etc., designed to give high gloss, moisture vapor resistance and heat seal for decorative papers, food wraps. Has good flexibility and scuff resistance. American Resinous Chemicals Corp.

GREASEPROOF HOT MELT

Flexible hot melt compound for food wrap paper coating. Application temperature about 250°F. Non-blocking and possesses a fair heat seal bond. Deposits colorless non-staining film. American Resinous Chemicals Corp.

GREASEPROOF LAMINANT #6236

A medium-bodied, light tan emulsion weighing 9 lbs. per gallon. This emulsion is a modified synthetic resinous adhesive of excellent stability and bonding characteristics. Properties: Produces a transparent flexible film showing excellent resistance to greases and oils. Flexibility is maintained at temperatures of —40° F. Adequate resistance to mineral oils can be obtained even when working with oils at temperatures of 300° F. This adhesive will pass JAN-P-121 specifications for greaseproof packaging. Can be brushed, roll coated or spread coated. Produces a tasteless, odorless, non-toxic film. Uses: As laminating adhesive in preparation of wrap from kraft papers to replace cellophane or cellulose acetate. As a saturating impregnant and adhesive for the preparation of laminated canvas or duck as a leather substitute. For the manufacture of greaseproof containers and packaging materials from kraft paper, newsprint or chipboard. Packaging of greases, etc. Available in steel containers from 1 to 55 gallons at our New York and Chicago plants. Paisley Products, Inc.

HEXITOL POLYMERIC ANHYDRIDES

A non-volatile mixture of hexitol derived polyhydroxy ethers. Hydroxyl value: 950-1050. Combining weight: 53-59. High-functional polyol for synthesis of drying oils, alkyds, and related compositions. Fast reacting. Gives rapid drying and good alkali resistant products with soya acids. Available in experimental quantities as a clear, amber colored, thick syrup containing 20% water. Atlas Powder Company.

HOMER CLAY

A refined white airfloated alumina silcate containing a very low percentage of Fe_2O_3, practically no lime or soda and very free from grit. Chemical analysis: % SiO_2, 46.0; % Al_2O_3, 39.1; % combined CaO, MgO, Na_2O, K_2O, 0.70. pH, 5.2; Hunter Reflectance, 80.2; R. I., 1.56; W. per Cu. Ft., 39 lbs. Uses: Ceramics, paper, textiles, insecticides (DDT, rotenone, tribasic dust, etc.), paints, enamels, leather, inks. Priced $11.00 per net ton f. o. b. Sandersville, Georgia Mill. United Clay Mines Corp.

IMPREGNOLE C-1A and IMPREGNOLE C-2A

A new two-component one-bath wax-alumina water-repellent compound of exceptional stability and effectiveness, particularly on cellulose acetate fibers. With this combination, maximum water repellency is obtained without stiffening the fabric. Warwick Chemical Co.

JAPAN WAX REPLACEMENT 979

A refined synthetic ester with chemical and physical properties similar to the natural product. Suitable for use in sizings, water-proofing, etc. M. P.: 128-32°F.; hardness, 22-25; color: white; acid value: 2; sap. value: 85-90. Cornelius Products Co.

KNOX OUT INSECT DUST

A dust containing 10% DDT and an inert carrier. It is recommended for killing ants, roaches, silverfish and carpet beetles. Pennsylvania Salt Mfg. Co.

KNOX OUT INSECT SPRAY

A liquid spray containing 5% DDT and other insecticidal ingredients. It is recommended as both a contact and residual spray for killing flies, mosquitoes, ants, roaches and insects found in homes, farm dairies, milk plants and other food processing establishments. Pennsylvania Salt Mfg. Co.

"KRENITE" DINITRO DORMANT SPRAY

A dormant spray. Suggested uses: Control of insects and plant diseases on orchard crops, small fruits and ornamentals. E. I. du Pont de Nemours & Co., Inc.

LATEX EMULSION 247-21

A high solids, high viscosity dipping latex for use in coating fabric, paper and composition for gasket stock or where minimum cold flow, oil and grease resistance are of primary importance. Formulated to yield an optimum cure at 275°F. Available either pigmented or clear. American Resinous Chemicals Corp.

LAURENE #110

Amber-colored liquid, water-soluble, ashless, high sudsing properties. Suggested uses: Shampoo base. The Beacon Co.

LAUXITE 101

Urea-formaldehyde condensation product used as a base resin adhesive with different catalysts and hardeners. Can be used for both cold-pressing and hot-pressing. It is supplied in liquid form and has unusual storage stability—at least 6 months at 70° F., which is approximately twice the life of liquid urea resins. Availability: Commercial quantities. I. F. Laucks, Inc., subsidiary of Monsanto Chemical Co.

LIQUID STRIP

A tough, flexible, noninflammable thermoplastic coating of low moisture vapor permeability. Excellent resistance to acids, alkalies and miscellaneous chemicals, and impervious to oils, greases and other petroleum hydrocarbons. The film produced has good heat-aging and abrasion-resistant properties. The film can be stripped when desired and will usually peel free in one piece. The film possesses high dielectric strength (approximately 700 volts per mil) and has a workable temperature range up to 175 degrees F. Color as desired. American Resinous Chemicals Corp.

LORRIDOL

Straw-colored organic liquid. Sp. Gr., 0.98. Sol. in water, 36% @ 25%° C. Miscible with alcohol, glycerine, vegetable oils, carbon tetrachloride, cyclohexanol, petroleum ether. pH of 5% aqueous solution, 8.7. Surface tension of 1% aqueous solution, 24.4 dynes /cm. @ 25° C. Lathers freely. Suggested uses: Wetting agent for textile processing, shampoo, emulsifying agent in cosmetics, dry-cleaning compounds, hair-waving fluids, leather emulsions, shaving cream, cold cream, vanishing cream, hand lotions, furniture and leather polishes, insecticide emulsions, rug and upholstery cleaner, white shoe cleaner, water-thinned paint. The Beacon Co.

"LUCITE" (HM-122)

(Heat resistant molding powder)

Combines the latest advance in heat resistance and molding properties. Developed to meet needs for a molded methyl methacrylate thermoplastic with increased heat stability where a material of lower heat distortion point cannot be used. A shorter molding cycle is possible through fast setting properties and greater uniformity. Provides improved optical properties of the finished product. Available in wide range of colors and recommended for both indoor and outdoor use. May be used in compression, injection and extrusion equipment. The yield temperature of articles molded may be 30 to 40°F. higher than for articles molded of other acrylic powders. Suggested uses: Lenses for military vehicles, flying light lenses, dial and meter faces, antenna insulators, oscillator housing caps, reflectors, medical and dental instruments, batteries, hair brushes, etc. E. I. du Pont de Nemours & Co., Inc.

LUPERCO AS

A new finely powdered catalyst compound containing 90% benzoyl peroxide and 10% stearic acid. The fine state of division of this material facilitates greatly the solution of the benzoyl peroxide in monomers. Contains 5.9% active oxygen. Insol. in water; sol. in most organic solvents. Suggested uses: Polymerization catalyst in the manufacture of plastics. Lucidol Corp.

LUPERCO ATC

A white thick paste consisting of 50% benzoyl peroxide with tricresyl phosphate as extender. Active oxygen 3.3%. Insol. in water; sol. in common organic solvents. Weight per gallon, 10.27 pounds. This material offers finely divided benzoyl peroxide in a safe and easily soluble state. Suggested uses: Catalyst for the polymerization of allyl type monomers. Lucidol Corp.

LUPEROX 3

An oil paste consisting of 45% benzoyl peroxide dispersed in linseed oil. Active oxygen

approximately 3.0%. Insol, in water, but sol. in common organic solvents. Weight per gallon, 8.92 pounds. Suggested uses: Catalyst for the polymerization of styrene impregnation mixtures for metal castings. Lucidol Corp.

METALCOTE

Non-baking synthetic resin system comprising primer coat and top coat for acid and alkali resistant coatings. Deposits tough flexible films possessing excellent adhesion. Available in all colors. American Resinous Chemicals Corp.

MINERAL SUPPLEMENT AGGLOMERATES

Intimate homogenous agglomerates containing Ca, P, Fe and other mineral constituents including Cu. Sized selectively for admixture with processed cereals. Disintegrate in water without grit. Suggested uses: For admixture with cereals to increase mineral content. Monsanto Chemical Co.

MOLDING LATEX 520-32A

A molding latex containing all compounding ingredients for a rapid and low temperature cure yielding its maximum tensile strength in 15-20 min. @ 120-125°. Molded items derived from this system are not only oil and grease resistant, but possess excellent strength even in thin films. American Resinous Chemicals Corp.

MONSANTO VINYL BUTYRAL DISPERSION D-1000

Water dispersion of polyvinyl butyral resin containing sufficient plasticizer to form a relatively soft, flexible film. Unusual among vinyl resin water dispersions in that it casts a film at room temperature and requires no heat to develop its full strength properties once it is dry. Stability toward coagulation. Will withstand freezing, boiling and severe agitation without breaking. Suggested uses: Coating and impregnating of fibrous materials where a continuous elastomeric film which is waterproof, highly greaseproof, and abrasion resistant is indicated; wherever the properties of vinyl butyral plastics are desired and where it is convenient to avoid the use of solvents (water is the only medium). Availability: Production quantities. Monsanto Chemical Company.

NEOPRENE TYPE 571 CONC.

An emulsion of polychloroprene having approximately 50% solids. It is made from Neoprene Latex Type 571 (50% solids) in such a manner than practically all free chloroprene is eliminated. It is, therefore, an odorless neoprene latex which is finding wide use in the manufacture of foam sponge and dipped articles. E. I. du Pont de Nemours & Co., Inc.

NEOPRENE TYPE S

A highly polymerized chloroprene which has very little plasticity. It is used almost entirely for the manufacture of crepe soles since, for this purpose, it has the advantage over natural rubber of not softening or spreading at elevated temperatures in addition to its normal resistance to oxidation and various oils and chemicals. Neopren Type S is excessively tough. It may be milled for long periods of time or remilled indefinitely without becoming soft and smooth at the surface. E. I. du Pont de Nemours & Co., Inc.

NEUTRONYX 330, 331, 332, and 333

A series of fatty acid esters of poly ether alcohols. Amber colored oily liquids. Sol. in water and common organic solvents. Non-ionic surface-active detergents, wetting, emulsifying, and dispersing agents. Resistant to high concentrations of electrolytes. Neutronyx 332 exhibits pronounced foaming properties persisting even at low concentration. It shows a wetting time (Draves Value) of approximately 10 seconds in 0.2% aqueous solution at 40° C. Neutronyx 330 has high detergency and emulsifying power. Neutronyx 331 and 333 possess wetting, foaming, emulsifying and detergency intermediate between 330 and 332. Conmercially available in anhydrous form as well as in aueous solutions. Industrial Division, Onyx Oil & Chemical Co.

NEVILLAC "R" SERIES RESINS

A group of semi-phenolic oil-reactive resins imparting unusual characteristics to varnishes containing them are available in three grades, Nevillac RT, RA and RP. Drying oil reactivity is in the order named. The Resins have these properties: M. P., 110-115°C. Color (Neville Standards), 1½-3. Iodine No. (Wijs Average), 112 Nevillac RT, 89 Nevillac RP, 70 Nevillac RA. Acid No. (max.), 2. Saponification No. (max.), 5. Sol. in ketones, esters, aromatic hydrocarbons, chlorinated hydrocarbons, turpentine, alcohols, except methanol, ethers. Insol. in water, aliphatic hydrocarbons, but properly cooked varnishes can be thinned completely with mineral spirits and the like. Compatible with cellulose derivatives, coumarone-indene resins, polystyrene, rosin esters, vinyl resins, urea resins, synthetic rubbers, phenolic resins both pure and modified. Suggested uses: Oleoresinous coatings, lacquers, adhesives, plastics, and industrial compounding operations. The Neville Company.

NORANE

A durable water-repellent compound, is now being successfully applied to wool either by padding with a 5 to 10% solution or by exhaustion in the dye-box or washer with successive additions of Glauber's salt. In either case, the fabric is dried and cured 5 to 10 minutes at 105 to 110 ° C. Warwick Chemical Co.

NYLON MOLDING POWDER FM-1

An injection molding composition of nylon which possesses unusual toughness and flexibility; extremely slow-burning, and practically unaffected by age. Can be injection-molded in thin sections. Under low service loads molded articles withstand distortion at temperatures up to approximately 380°F. Density, 1.14 gr. per cc. Suggested uses: Valve seats, electrical coil forms for radio and sound-powered telephone head sets, switch housings, jacketing for telephone wire, slide fasteners, grommets, gaskets, etc. E. I. du Pont de Nemours & Co., Inc.

NYTRON

A new synthetic organic detergent derived from a petroleum base to give a complex organic sodium sulfonate. Contains about 17.5% carbon, equivalent to about 35% organic content. Light buff colored flakes. Soluble and effective in soft water, hard water, and alkaline solutions. High solubility permits preparation of concentrated solutions. Unusually good resistance to precipitation in hard water. pH 8.5-9.2 in dilute aqueous solutions. Density of flaked product about 31 pounds per cubic foot. Good surface tension depressant and wetting properties which augment its primary detergent properties. Suggested uses: Textiles including wool, cotton and synthetic fibres, laundries, food and beverage equipment, pulp and paper, metal degreasing, insecticides, soap, rubber, transportation equipment. Available in 80 pound bags in limited quantities. The Solvay Process Company.

ONYXSAN GT

Cationic material. Light yellow paste. Organic content, 45%. Sol. in water. pH of 1% solution, 7-8. Suggested uses: softening agent for textiles; emulsifying agent. Onyx Oil & Chemical Co.

ONYXSAN LG

Cationic material. Light yellow paste. Organic contest, 45%. Sol. in water. pH of 1% solution, 7-8. Suggested uses: softening agent for textiles; emulsifying agent. Onyx Oil & Chemical Co.

PAPER IMPREGNANT 480-14

A high solids impregnating system for paper derived from a resin-modified, processed synthetic rubber latex. For application where high solids take up and maximum internal cohesive and ply strength are required. It is possible to employ up to 50% solids in the impregnating bath and attain almost instantaneous saturation of the stock. Will cure during the normal drying operation thereby rendering maximum strength to the treated paper. American Resinous Chemicals Corp.

PAPER IMPREGNANT 451-26

Resin-modified, curing-type, Buna latex dispersion formulated to give rapid and complete saturation for high void paper stock and fabrics. Material impregnated with 451-26 will possess good tear and tensile strength, increased water resistance and excellent aging characteristics. Treated stock may be coated with nitrocellulose lacquers without discoloration. American Resinous Chemicals Corp.

PASTE WAX POLISH CONCENTRATE 1240

A blend of refined vegetable and mineral waxes for use in solvent paste wax polishes. M. P., 165/70°F.; hardness 9-10; color: amber; acid value: 4-5; sap. value: 21-22. Excellent solvent retention, light colored, hard paste wax. Cornelius Products Co.

PENCO D.D.T.

Technical grade dust and spray bases for insecticide purposes. Pennsylvania Salt Mfg. Co.

PENCO GARDEN DUST

A dust containing 5% DDT and an inert carrier. It is recommended to combat a variety of garden and agricultural insect pests. Pennsylvania Salt Mfg. Co.

PENCO GRAIN FUMIGANT

A colorless liquid for the control of certain insects attacking grain in mills, elevators, box cars, and farm storage. Pennsylvania Salt Mfg. Co.

PENCO WDB-50

A wettable dust base containing DDT for use in the manufacture of insecticide dusts and sprays. Pennsylvania Salt Mfg Co.

PENSALCO

A descaling agent containing an inhibitor which protects iron from the action of the mineral acid. It is a solvent for scale formed by hard water and alkalis on can washers and bottle washers. It dissolves the mineral constituents of milkstone leaving milk residues easily removable. Suggested uses: Descaling milk bottle washers and can washers. Pennsylvania Salt Mfg. Co.

PENNSALT EC-10

A ready-to-use solvent emulsion cleaner for removing grease and oil from any metal surface. It is especially adapted to the quick removal of drawing compounds or cutting oils in a single operation. Suggested uses: Precleaner before alkaline electrocleaning and subsequent plating; cleaning before painting; and cleaning of painted surfaces. Pennsylvania Salt Mfg. Co.

PENNSALT PM-90

A specially prepared acid cleaning and descaling compound which contains addition agents for surface action and inhibition. Suggested uses: Pickling bath concentrate in electroplating shops and as an acid cleaner for removing water scales from boilers and industrial equipment. Pennsylvania Salt Mfg. Co.

PENNSALT PRF CEMENT

A quick-setting, cold-hardening acid, alkali and solvent proof product composed of a liquid and a powder which, when mixed, react chemically to form a cement. Suggested uses: Bonding corrosion-proof brick and tile in uses where acids, alkalis and solvents are encountered. Pennsylvania Salt Mfg. Co.

PETRONATE

Purified petrolatum sulphonates with the following typical composition: Sulphonates, 62%; Mineral Oil, 35%; Water, 3%; Inorganic Salts,

None; Free Acid or Alkali, None; Molecular Weight, 440/470. Suggested uses: Lube oil additive, manufacture of soluble cutting oils, emulsion polishes and cleaners, emulsion sprays and fungicides, anti-corrosion and rust preventive compounds, inks and paints, etc. L. Sonneborn Sons, Inc.

PHOSPHATE NO. 12

Non-Ionic surface active phosphorus compound. Physical state, liquid, amber color. Sp. Gr., 1.121 (28° C.). Analysis, 16.0% P_2O_5. Surface Tension 0.2% Soln). Solubility: Insol. in naphtha; sol. in alcohols, acetone, toluol; milky solution in waater. Suggested use: Non-ionic wetting agent. Victor Chemical Works.

PHOSPHATE NO. 24-C

Non-ionic surface active phosphorus compounds. Physical state, liquid. Amber color. Analysis, 15.0% P_2O_5. Surface tension (.2% soln). Solubility: Sol. in water. Suggested use: Non-ionic wetting agent. Victor Chemical Works.

PHOSPHATE NO. 67

Phosphate Emulsifiers. Physical state, liquid, amber color. Sp. Gr., 1.018. Analysis, 16.0% P_2O_5. Solubility: Sol. in methanol, acetone, kerosene; opalescent solution in water, naphtha, toluene. Suggested uses: Emulsifier; oil-additive; surface-active agent. Victor Chemical Works.

PHOSPHATE NO. 89

Phosphate Emulsifiers. Physical state, liquid, amber color. Sp. Gr., 1.100. Analysis, 16.0% P_2O_5. Solubility: Sol. in water, organic solvents, naphtha, kerosene. Suggested uses: Emulsifier; surface-active agent; oil-additive. Victor Chemical Works.

pHR

Agent for the control of alkalinity of neoprene latex. Can be added without producing coagulation or materially reducing the storage stability of the latex or its compounds. E. I. du Pont de Nemours & Co., Inc.

PLIATAB COLD PADDING GLUE

A vinyl polymer adhesive which is used for paper padding and general cementing operations in binderies. Ready to use, applied by water moistened brush, or diluted with water for spray gun application. Available in red, blue or white (natural) color. Paisley Products, Inc.

POLYAC

Accelerator-activator for GR-I butyl rubber. Light yellow brown powder. Sp. Gr., 2.6. Generally used in conjunction with sulfur and an accelerator of the thiuram type such as tatremethyl-thiuram-disulfide. Polyac is an effective accelerator for neoprene latex compositions. E. I. du Pont de Nemours & Co., Inc.

POLYCO EMULSION 117

A high solids vinyl acetate copolymer emulsion which in itself will deposit a hard, tough water-white film. May be plasticized directly by addition of active plasticizer or with plasticizer emulsions. Plasticized systems possess good flexibility and heat sealing properties. Product series recommended for coatings, adhesives, and impregnants. Available in 55-60% solids, pH of 4. 9 lbs./gal. and packaged in 55-gallon wooden barrels. American Polymer Corporation.

POLYTHENE

A plastic possessing flexibility and toughness over a wide range of temperature, unusual low water absorption and water vapor transmission, chemical inertness and excellent dielectric properties. With a Sp. Gr. of 0.92-0.93 it is among the lightest of all plastics. Suggested uses: Covering for electrical wiring and cables, gaskets, battery parts, waterproof coatings, adhesives, ice-cube trays, bottle stoppers, jar tops, protective coverings, grommets and bottle cap liners for corrosive chemicals. E. I. du Pont de Nemours & Co., Inc.

PROTEIN HYDROLYSATE

A hydrolyzed protein derivative from corn and wheat proteins, containing approximately 30% salt. Use: As a source of essential amino acids. Availability: Available from stock. The Edwal Laboratories, Inc.

P. T. RESIN

Yellow to reddish-yellow resin. Softening Point, 75-80° C. Acid number, 167; Rosin acid number, 158; Saponification number, 170; Unsaponifiables, 6.5%. Color N to K on standard rosin scale. Water insol.; sol. in most organic solvents. Suggested uses: Preparation of ester gum, printing inks, paper sizing.. Monsanto Chemical Co.

QUATRONYX D-40 A

A quaternary ammonium halide. Soluble in water, most electrolytes and in both concentrated acidic and alkalime solutions including 32° Bé caustic soda. A surface-active compound, fungicide and bactericide. Available as 40% aqueous solution. Onyx Oil & Chemical Co.

RESIN DISPERSION C101 (Polyvinyl Acetate)

Contains 25% of polyvinyl acetate as an aqueous dispersion of extremely fine particle size. Air drys to a clear, tough, colorless film and is recommended for the impregnation of fibrous materials such as cotton, rayon, nylon, paper and wood pulp. Product contains only resin, dispersing agent, and water and presents no inflammability or toxicity hazards in use. Available in pilot plant quantities. Onyx Oil & Chemical Co.

RESIN DISPERSION CB (Polymethyl Acrylate)

Contains 25% resin and is free of solvents other than water and therefore presents no inflammability or toxicity hazards in use. Air drying gives a clear, colorless, flexible film. Recommended for impregnation of cotton, rayon, drying gives a clear, colorless, flexible film. pilot plant quantities. Onyx Oil & Chemical Co.

RESIN DISPERSION C-2B (Vinyl-Acrylic Copolymer)

Contains 25% of resin in an aqueous dispersion of extremely fine particle size. Air drys to a clear, colorless, tough, somewhat flexible film. Product contains only resin dispersing agent and water and presents no inflammability or toxicity hazards in use. Recommended for impregnation of cotton, rayon, nylon, paper and wood pulp. Available in pilot plant quantities. Onyx Oil & Chemical Co.

RESIN DISPERSION CD-1 (Polymethyl Methacrylate Dispersion)

Contains 25% polymethyl methacrylate and is free of solvents other than water and therefore presents no fire or toxicity hazards in use. Oven drying gives a clear, somewhat brittle film. Shows promise as a dulling agent for synthetic fibers and as an impregnating agent for special effects. Available in pilot plant quantities. Onyx Oil & Chemical Co.

RESIN DISPERSION CD-2 (Polystyrene Dispersion)

Contains 25% polystyrene and is free of solvents other than water and therefore presents no inflammability or toxicity hazards in use. Oven drying gives a clear, somewhat brittle film. Shows promise as a dulling agent for synthetic fibers and as an impregnating agent for special effects. Available in pilot plant quantities. Onyx Oil & Chemical Co.

RESLOOM HP

Dry, very hygroscopic powder. pH, 9.5. Color: white. Slight toxicity. Non-inflammable. Stability on storage is permanent if kept dry. Uses: Resloom HP is a dried organic resin of similar character to the liquid product Resloom M-75 and may be used for the same purposes and effects. Developed particularly for applications where extreme softness of goods is required. Availability: Limited commercial quantities. Monsanto Chemical Co.

RESLOOM M-75

Aqueous water-white solution of an organic resin. Sp. Gr., 1.18; pH, 9.0-9.5; Wt. per gal., 9.9 lbs. Flash Point, 158° F., but will not burn. Toxicity, slight. Stability on storage, permanent. Uses: Developed for textile application and may be used on cotton or wool, viscose rayon or acetate rayon, linen or aralac as well as mixtures of these fibers. It is possible by proper application to modify fibers and fabrics with the use of M-75 to obtain effects that cannot be produced by other means. Among the effects are reduction of the shrinkage and felting; increase in fastness to washing and resistance to crocking of many dyestuffs; increase in the resilience of cottons; increase in the fullness of rayon-cotton mixtures, etc. Availability: Limited commercial quantities. Monsanto Chemical Co.

RESLOOM NC-50

An aqueous solution of an organic resin. Sp. Gr., 1.15; pH, 9.0-9.5; Wt. per gal., 9.6 lbs. Flash Point, 158° F., but will not burn. Toxicity, slight. Color: water-white. Uses: Similar to Resloom M-75 and offers the same advantages and effects. Particularly developed for applications where chlorine pick-up is the problem. Availability: Limited commercial quantities. Monsanto Chemical Co.

"RH"-806 RESIN

A pale yellow-to-amber, transparent resin. Odorless and tasteless. Somewhat rubber-like, tough, slightly tacky and thermoplastic. This resin is sol. in ketones; insol. in water, methanol, ethanol, butyl acetate, cellosolve, benzol, toluol, gasoline and trichlorethylene. Swells in water and dilute acids with whitening and softening. Unstable in strong acids and alkalies. Compatible and forms films with thermosetting, phenolformaldehyde resins, Santolite K, Petrex 5 and nelio resin. Suggested uses: Adhesive, softener in rubber compounding. Molds readily at 100°C. Available in limited quantities. E. I. du Pont de Nemours & Co., Inc.

RIBOFLAVIN MIXTURE #3

An impalpable mixture of crystalline riboflavin and starch, having a guaranteed potency of one gram of riboflavin per ounce of mixture. It is an easily diffusable mixture, having free flowing properties. Suggested uses: It is used in the food and animal feed industries where riboflavin additions are desired, but incorporation of crystalline riboflavin is difficult due to the small quantities involved. Cartons—25, 50 and 100 pound drums. Chas. Pfizer & Co.

S&W AROCHEM 333

Acid number, 35-45. M. P., °C., 165-175. Viscosity-G. H. (60% in Toluol), Z₃-Z₃. Color G. H. 1933—(50% cut), 10-12. Completely sol. in coal-tar solvents and medium and low viscosity drying oils; partially sol. in petroleum solvents. Insol. in ethyl alcohol. An exceptionally high melting, modified phenolic resin. A wide departure from the conventional modified phenolics. Produced specifically for use with linseed, dehydrated castor and other slow polymerizing oils. Uses: Ability to produce varnishes of normal viscosities while utilizing unbodied oils. These varnishes requiring cooking schedules of equal length, or only slightly longer, than varnishes made by cooking conventional modified phenolics with pre-bodied oils. Soft oil varnishes exhibit fast drying properties. Relatively pale colored varnishes are obtainable. Large polymer size of this resin results and its polymerizing properties with oils yields ink vehicles of maximum hold-out. Not recommended for use with tung or citicica oils or with kettle bodied oils with viscosities above Q-R (Gardner Holdt). U. S. Industrial Chemicals, Inc.

S&W AROPLAZ 906

Solutions (Xylol with trace Butanol), 49-51% N. V.; Viscosity (G. H.), P-U; Acid Number (solvent free resin), 6-10; Color (G. H. 1933),

3-5; Wt/gallon @ 25°C., 8.25-8.35 lbs.; Sol. in coal-tar hydrocarbons and lacquer solvents. Insol. in petroleum hydrocarbons and ethyl alcohol. A short oil, pure, non-oxidizing alkyd resin for use in high-bake urea or melamine enamels and, in color retentive clear and light colored nitrocellulose lacquers. Compatible in all properties with most urea and melamine resins. U. S. Industrial Chemicals, Inc.

S&W AROPLAZ 1086

Solution in Mineral Spirits, 49-51% N. V.; Viscosity (G. H.), U-X; Acid Value (solvent free resin), 10-15; Color (G. H. 1933), 7-9; Weight per gallon @ 20°C., 7.5-7.6. Sol., Completely soluble in the usual petroleum and coal-tar hydrocarbons. Insol. in alcohol. Miscible with unbodied and medium viscosity drying oils; also with cold-cut resins and many alkyds. A new type of pure, oxidizing alkyd resin of medium oil length. Outstanding resin of this classification which is well suited for use in the production of air-drying or baking finishes of the brushing, spraying or roller coating types. Very pale resin, with color retentive properties superior to conventional alkyds of comparable type. It is recommended for use in white and light tint air-drying or baking finishes. Such products are fast drying and bake in short cycles at low temperatures. Protective coatings have excellent leveling properties and dry to hard, tough and durable films which have very good adhesion, flexibility and resistance to chalking. Excellent gasoline and oil resistance, as well as good water and mild alkali resistance. Enamels are high in gloss and outstanding in gloss retention. Drier suggestions for average finish (expressed as metal, based on total resin solids): Air drying —.03% Co., .03% Mn. and .30% Pb. Low Bake—.01% Co., .20% Zn. Uses: Automotive refinishing enamels, architectural enamels, gasoline pump enamels, metal primers and finish coats (general), machinery enamels, roller-coating finishes, silk screen enamels. U. S. Industrial Chemicals, Inc.

S&W AROPLAZ 1241

Solution in Mineral Spirits, 69-71% N. V., 54-56% N. V.; Viscosity (G. H.), Y-Z_1, G-K; Acid Number, 6-10, 6-10; Color (G. H. 1933), 7-9, 7-9; Wt./gallon @ 250°C., 8.05-8.15 lbs., 7.6-7.7 lbs. Sol. in petroleum and coal-tar hydrocarbons. Insol. in ethyl alcohol. Compatible with a wide range of vegetable drying oils, varnishes and other alkyds. A long oil, pure, oxidizing alkyd resin, suited for use in the manufacture of a wide range of brushing type finishes, architectural enamels, mill-gloss whites, marine finishes and exterior paints and enamels. A relatively non-reactive vehicle and can be used with the normal percentages of zinc oxide and other basic pigments. Can be blended with a wide variety of drying oils, varnishes and other alkyds. U. S. Industrial Chemicals, Inc.

SANTOMERSE B

Soft, white, waxy flakes or powder. Sol. in water. Somewhat hygroscopic. Non-toxic. Suggested use: As a detergent where high purity is required. Monsanto Chemical Co.

SANTOWAX OH
(Hydrogenated o-terphenyl)

Light yellow oil. Sp. Gr., 0.94 @ 25° C.; Dist. Range, 324-332° C.; R. I., 1.560 @ 25° C. Viscosity, 211 S.U.S. @ 100° F. and 36.2 S.U.S. @ 210° F.; Pour Point, 11° F.; Flash Point, 330° F.; Flame Point, 340° F. Dielectric constant, 2.11 @ 100° C. Insol. in water; sol. in most organic solvents. Suggested uses: Plasticizer, special lubricant. Monsanto Chemical Co.

SANTOWHITE

Poly-alkylated phenol monosulfide. Sp. Gr., 1.07 @ 25° C. Soft brown resin at 25° C. Insol. in water; sol. in CCl_4, benzene, ether, CS_2, acetone and alcohol. Suggested uses: As a non-discoloring antioxidant for natural and synthetic rubbers. Availability: Commercial quantities. Monsanto Chemical Co.

SANTOWHITE A

Brown resin. Sol. in methyl alcohol, ethyl alcohol, benzene, petroleum ether; insol. in water. Uses: As a non-discoloring antioxidant for natural and synthetic rubber. Monsanto Chemical Co.

S. D. W. ROSIN

Yellow crystalline solid. Freezing Point, 150-155° C. Acid number, 180; Rosin acid number, 178; Saponification number, 183; Unsaponifiables, 1%. Water insol.; sol. in most organic solvents. Suggested uses: Preparation of ester gum, varnish ingredient, paper size, soaps. Monsanto Chemical Co.

SELLOGEN C

Higher alcohol sulfate used for detergency, cleansing compounds, and wetting out. Jacques Wolf & Co.

SODIUM ZINCATE ZA-4

A slightly gray flaked solid zincate corresponding to the approximate analysis of 4% zinc oxide, 92% caustic soda, and 2% water. Stable solutions can be made in low concentrations. Suggested uses: Textiles, treatment of acid and cannery waste waters, and boiler water treatment and other uses. Available for experimental investigation. Wyandotte Chemicals Corp.

SODIUM ZINCATE ZA-30

A slightly gray flaked solid zincate corresponding to the approximate analysis of 30% zinc oxide, 54% caustic soda, and 15% water. Metastable water soln. can be made in conc. as low as 20% zincate. Suggested uses: Textiles, treatment of acid and cannery waste waters, electroplating and boiler water treatment and other uses. Available for experimental investigation. Wyandotte Chemicals Corp.

SPEEDBOND HARDENER

A new catalyst or hardener to use in connection with Lauxein 888-P casein glue. This combination of glue and catalyst results in a gluing process whereby lumber may be edge-glued quickly. Catalyst is applied to one surface and glue to the other. Through momentary clamping, varying from 15 seconds to 2 minutes, a bond is formed that will stand handling. Glue joint is water-resistant. Speedbond catalyst is only supplied with Lauxein 888-P and not sold separataely. I. F. Laucks, Inc., subsidiary of Monsanto Chemical Co.

SULFADOL

Amber organic liquid. Sp. gr. 1.02. Sol. in water, 50% @ 25° C. Miscible with alcohol, glycerine, vegetable oils, carbon tetrachloride, cyclohexanol, petroleum ether. pH of 5% aqueous solution, 7.5. Surface tension of 1% aqueous solution, 24.2 dynes/cm. @ 25° C. Lathers freely. Suggested uses: Wetting agent for textile processing, shampoo, emulsifying agent in cosmetics, dry-cleaning compounds, hair-waving fluids, leather emulsions, shaving cream, cold cream, vanishing cream, hand lotions, furniture and leather polishes, insecticide emulsions, rug and upholstery cleaner, white shoe cleaner, water-thinned paint. The Beacon Co.

SULFASAN

Bis-ethyl xanthogen. Sp. Gr., 1,260 @ 25° C.; M. P., 18-20° C. Light brown oil at room temperature which changes to a light brown solid when cooled below 20° C. Sol. in alcohol, ether, CS_2, CCl_4, and benzene; insol. in water. Suggested uses: As a vulcanizing agent for synthetic rubber. Availability: Sample quantities. Monsanto Chemical Co.

SYNTHEBOND

A two system adhesive combination for adhering synthetic rubber to metal. After proper cleaning and coating with primer #555-3, Cement 555-4 is applied. After a short drying interval, final assembly is made and cured under heat and pressure. Suitable for bonding both cured and uncured synthetic rubber stocks. American Resinous Chemicals Corp.

SYTON W-20

A colloidal water dispersion of inorganic silica. Slightly milky in appearance. Sp. Gr., 1.10; pH, 8.0-9.0; Wt. per gal., 8.6-8.7 lbs. Stability, permanent at 25° C. Non-inflammable. Non-toxic and non-irritant. Suggested uses: Syton W-20 is developed for anti-slip applications on plain weave or satin weave filament synthetic fiber fabrics, also as a crisp "full" finish for cotton voiles and other light fabrics. Availability: Full commercial quantities. Monsanto Chemical Co.

TECTASE

A highly concentrated amylolytic and proteolytic enzyme in powder form. It is effective for removal of starch and gelatin sizing materials from textiles. It is nine times as effective as liquid desizing agents and is more economical and more stable to prolonged storage. Warwick Chemical Co.

TETROSAN

Aqueous solution of a quaternary ammonium halide. Colorless to slightly yellow liquid. Cationic germicide, disinfectant and fungicide. Phenol coefficient of anhydrous material, 900 against *S. aureus* at 20° C. and 800 against E. typhi at 20° C. Non-toxic and non-irritating in use dilutions. Commercially available in 10% aqueous solution and in 60% aqueous concentrate. Industrial Division, Onyx Oil & Chemical Co.

THALID X-100 RESINS
(Casting Sealant)

The cured resin is a somewhat rubbery nonporous solid, insol. in aromatic gasoline, lubricating oil, ethylene glycol, isopropyl alcohol, and water. Because the material is thermosetting it has a good thermal stability. In either uncured or cured form does not attack magnesium or ferrous metals. Combines maximum efficiency in sealing porosity in metal castings with ease of handling in plant or foundry. Availability: Production quantities. Monsanto Chemical Co.

THALID X-500 RESINS

Completely reactive thermosetting resins used for producing high strength laminates at contact pressure. Produces hard, rigid panels in a short curing cycle. Can be bag molded or cured in a platen press to produce curved parts or flat panels. Furnished as a syrup with viscosity of approximately 18 poises. A catalyst and, in some instances, suitably inhibited styrene monomer are supplied separately. Can be used to bond glass, cotton fabric or paper. Availability: Production quantities. Monsanto Chemical Co.

"UCON" SYNTHETIC LUBRICANTS AND HYDRAULIC FLUIDS

New internal combustion engine lubricants and hydraulic fluids containing no petroleum oil. Made in two types—water soluble and water insoluble. Can be manufactured to any desired viscosity and are wax-free. Pour points, from −30 to −80°F. Flash points, from 300°F. up. Densities approximating that of water. Carbon residue values, <0.01%, regardless of viscosity. Characterized by low change of viscosity with change in temperature. Viscosity indices in the range of 140 to 160. Large quantities used in military equipment during the war. Ease of starting in cold weather and freedom from gum, sludge and varnish formation are outstanding advantages. Carbide and Carbon Chemicals Corporation.

VELSICOL RESIN AD 6-3

Synthesized resin of petroleum chemical origin. Formulated in combination with vegetable drying oils in varying oil lengths to produce a varnish for either air-dry or baking purposes. Applied film demonstrates exceptional water and alkali resistance. Velsicol Corp.

VELSICOL AR-CONCENTRATE

Effective insect toxicant of petroleum chemical origin which demonstrates 100% kill by Peet-Grady method when formulated on the basis of 2% AR-Concentrate, 98% base oil. Velsicol Corp.

VICTOR WETTING AGENT 58X

A white, granular mixture. A modification of Wetting Agent 58B which is resistant to hard water. Sinking time at 0.6% concentration, 25 sec. (Draves test). Victor Chemical Works.

VINOSOL

A 60% solids dispersion of vinyl copolymer in xylol-naphtha mixture. Upon drying and fusing

at temperatures between 275°F. and 375°F., a tough, flexible vinylite film is deposited having water, grease, and fire resistant characteristics. Available in all colors. Used for cloth, paper, and metal coating where it is desired to deposit vinylite films with a minimum of coats. Non-toxic, non-irritating, may be made suitable for coating belting for food conveyors. American Resinous Chemicals Corp.

VULTAC NO. 1

Alkyl phenol monosulfide. Sp. Gr. at 25/25°C., 1.11-1.12. Softening point, (ASTM E28-36T) 45-55°C. Sulfur content, 13%. Soft, brown resin, readily sol. in all common organic solvents. Uses: Vulcanizing agents for butadiene copolymer synthetic rubbers. Available in commercial quantities. Sharples Chemicals Co.

VULTAC NO. 2

Alkyl phenol disulfide. Sp. Gr. at 25/25°C., 1.16-1.17. Softening Pt., (ASTM E28-36T), 55-65°C. Sulfur content, 23%. Hard, brown resin, readily sol. in organic solvents except alcohols. Uses: Vulcanizing agent for butadiene copolymer synthetic rubbers. Available in commercial quantities. Sharples Chemicals Inc.

VULTAC NO. 3

Alkyl phenol disulfide. Sp. Gr. at 25/25°C., 1.19-1.20. Softening Pt. (ASTM E28-36T), 70-80°C. Sulfur content 28%. Hard, brown resin, readily sol. in organic solvents except alcohols. Uses: Vulcanizing agent for butadiene copolymer synthetic rubbers. Available in commercial quantities. Sharples Chemicals Inc.

WARCO A-79

A highly effective gas-fading inhibitor for acetate rayons. It is a white, finely crystalline powder which is readily soluble in water to form an alkaline solution. ½ to 1% applied to the fabric will protect it against fading for more than a year of exposure to atmospheric gas fumes. Warwick Chemical Co.

WARCO A-84

An anionic substantive softener which is effective when applied from very dilute solutions. It does not discolor white goods or affect the light-fastness of dyeings. The soft finish obtained by the application of this compound is not greatly affected by laundering. Warwick Chemical Co.

WARCO A-23A

An improved fire-retardant composition. It is a free-flowing neutral powder which does not contain acidic compounds or ammonium salts (hence it cannot tender textiles or paper on drying at elevated temperautres). It is effective for flameproofing fabrics, garments, paper or textile decorations, drapery etc. It is applied from water solution by dipping, brushing or spraying. WARCO A-23A is non-crystallizing and stable to hydrolysis, hence, it does not dust out of the treated material or lose its effectiveness in moist air. Warwick Chemical Co.

WARCO A-90

A blend of sulfated high-grade vegetable oils of superior stability and softening power. It is especially suitable for finishing fine cotton and rayon fabrics and for Sanforizing. It does not oxidize, discolor or become rancid. Warwick Chemical Co.

WARCOSOL 60-S

An alkyl aryl sulfonate wetting agent of very high efficiency. It is a viscous, amber liquid which dissolves readily in water. It is recommended for all textile wetting and rewetting applications. Warwick Chemical Co.

YELLOW BEESWAX REPLACEMENT 1270

A refined synthetic waxy ester suitable for cosmetics, pharmaceuticals, textile treatment, polishes, etc. M. P.: 146/50°F.; hardness: 20-22; color: light amber; acid value: 18-20; sap. value: 92-96. Cornelius Products Co.

"ZERLATE" FUNGICIDE

A new and effective fungicide based on zinc dimethyl dithiocarbamate. Suggested uses: Control of certain vegetable plant diseases. E. I. du Pont de Nemours & Co., Inc.

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Attapulgus Clay Company
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Philadelphia, Pa.

Beacon Company, The
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Boston 30, Mass.

Buffalo Electro-Chemical Co., Inc.
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Buffalo 7, N. Y.

Carbide and Carbon Chemicals Corp.
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Chicago 5, Ill.

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New York 17, N. Y.

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General Drug Company
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The New BORON CARBIDE MORTAR IS THE HARDEST Ever Produced

Materials Arranged According to Moh's Scale of Hardness

1. Diamond
2. **Boron Carbide**
3. Silicon Carbide
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6. Sapphire
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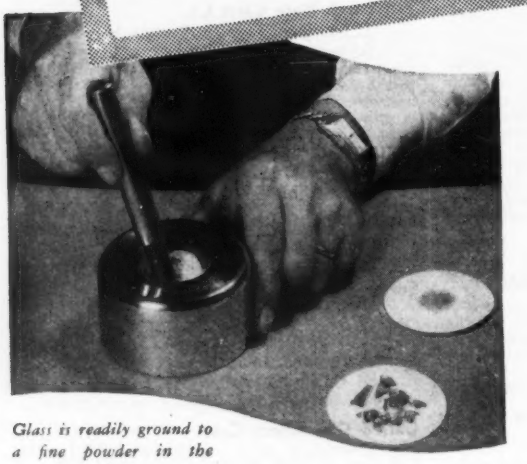
9. Quartz
10. Agate



Glass is readily ground to a fine powder in the new Mortar.

Non-Magnetic Mortar in a Stainless Steel Housing

Extremely hard materials are readily reduced to fine particles for chemical and physical examination by the new Boron Carbide Mortar and Pestle. They are much harder than previously available mortars; they fill a need for grinding samples in laboratories performing spectrographic analyses, studies of phosphors, highly accurate analyses, and similar work.

Materials which do not yield readily in other mortars but are easily broken up in the Boron Carbide Mortar include beryl, precious stones, zirconium carbide, emery, carborundum, topaz, and many other minerals, ores, abrasives, glasses, ceramics, etc.

3 Sizes Available

Diameter of Bowl	1″	2″	3″
Diameter of Housing	2½″	3¾″	4¾″
Pestle Length	4½″	5″	5½″

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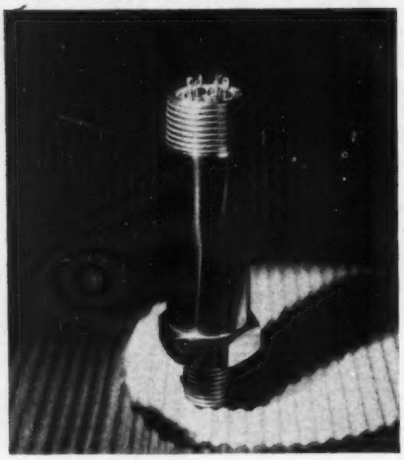
NEW EQUIPMENT

Pressure Gauge And Control QC 647

Utilizing the principle that the electrical characteristics of a wire filament change with a physical strain, the Baldwin Locomotive Works' Southwark Division has developed a pressure sensitive device that promises to open whole new fields of measurement and control.

The new instrument, called the SR-4 Pressure Sensitive Device, is used to convert gas or liquid pressure to electrical



energy for measuring, recording or controlling. Its extreme accuracy, 0.25% of full scale having been consistently obtained, will mean that the device can be used for control operations that heretofore have not been possible. It is available in several ranges up to 0-to-20,000 pounds per square inch.

Since it is essentially an electronic device it will enable results to be transmitted long distances whether for direct reading, recording or control. Transmission even by radio is feasible. This will eliminate the leakage and clogging troubles in conventional capillary tubes used with other pressure sensitive instruments.

The heart of the device is a very fine filament wire bonded to a hollow metal core against which is exerted the gas or liquid pressure to be measured. As the pressure increases this filament stretches, thus changing the diameter of the wire and causing measurable changes in the electrical resistance of the wire. This change in resistance varies the amount of current flowing through the filament circuit and, when amplified, these changes show up on the dial or are used to actuate a control system. The filament is sensitive to a "stretch" of the metal core of only one-millionth of an inch. It is this ability to measure great changes in pressure without any physical movement that has led to a description of the instrument as being actuated by the "breathing" condition of the metal.

The SR-4 Pressure Sensitive Device is hermetically sealed and an ingenious built-in compensator cancels out the effect of any extraneous force such as temperature. It is approximately one inch in diameter and five and one-half inches in length.

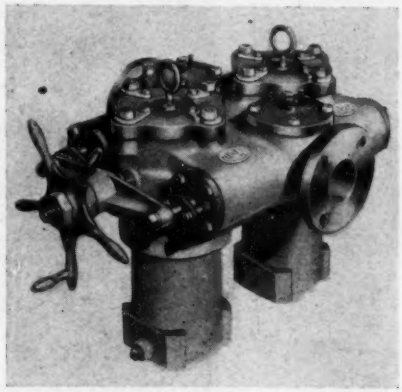
The SR-4 Pressure Sensitive Device is, as its name implies, based on the principle of the SR-4 strain gage which in the five years since its introduction has proved itself to be the most efficient instrument yet devised to give engineers accurate information on the strains and stresses of materials and structures under actual load conditions.

Duplex Strainer QC 648

A duplex vertical chamber disc type pipeline strainer designed to assure continuous flow in pipelines, has been announced by J. A. Zurn Manufacturing Co. It is operated by a large handwheel that reverses valves simltaneously with minimum pressure drop and capacity flow is assured at all positions of the operating handwheel.

Another unusual aspect is the eccentrical position of the strainer basket, with respect to the basket chamber, so that the flow section is proportional to the flow needs at all points, thus minimizing pressure drop. The usual practice of setting the strainer basket concentrically creates a fluctuating flow of liquids in regard to flow needs, thus stimulating fluid friction loss.

Removable covers provide easy access to the basket chamber and permit

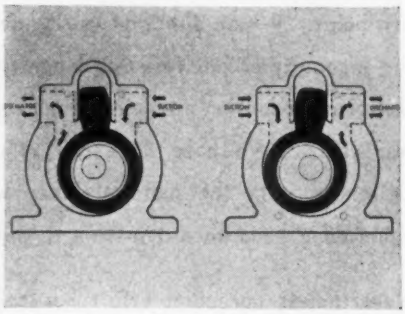


easy and complete cleaning. Large handholes above each valve assembly permits servicing of the valves without removing the strainer.

This unit protects all types of pumps, traps, valves, regulators, aspirators, injectors, control units and other primary equipment. It is made in cast bronze, steel, semi-steel, and cast iron; the basket, of perforated brass, monel, or other specified metals.

Gearless Pump QC 649

An improved gearless pump for water, light oil or other liquid circulating use has been introduced by Eco Engineering Co. A feature of the new pump is that it is



equipped with water lubricated bearings. No adjustments are needed and all metal is of bronze.

The pump can be mounted at any angle and operated in either direction with equal efficiency. The gearless feature prevents jamming or breaking of gears and opening the face plate allows quick removal of any obstructing material.

The removable impeller is composed of several layers of laminated sections, vulcanized together under great pressure, enabling sandy, muddy, or gritty particles to pass without harm to the pump. It is

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QC 647	QC 654	QC 661	QC 668
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QC 649	QC 656	QC 663	QC 670
QC 650	QC 657	QC 664	QC 671
QC 651	QC 658	QC 665	QC 672
QC 652	QC 659	QC 666	QC 673
QC 653	QC 660	QC 667	

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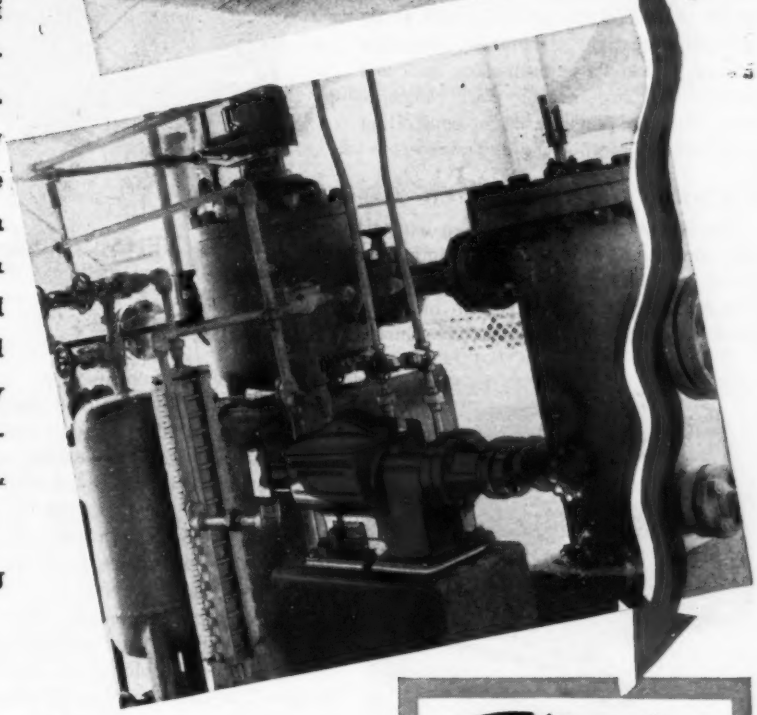

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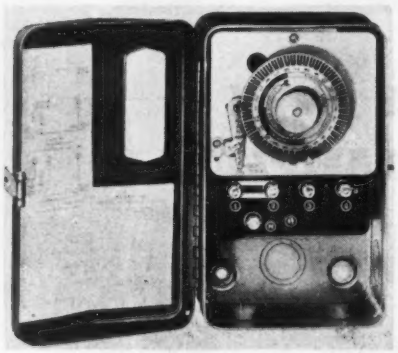
available with single impeller and standard ½" connection and double impeller with standard 1" connection.

Time Switches QC 650

The latest improvement in the 300 series time switches of the Paragon Electric Co. is the Telechron motor, an industrial type, self-starting synchronous motor which adds years to the life of the time switch. The operating advantages of this

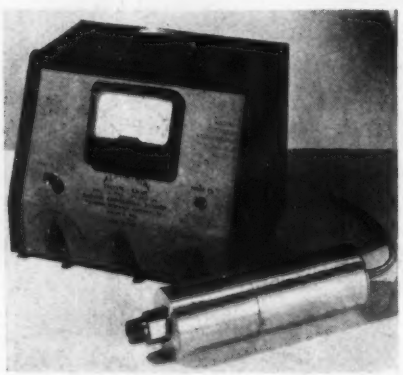


type motor are many—complete, self-oiling lubrication by patented capillary oiling system, practically instantaneous self-starting at full rated load, gear reduction fully sealed to exclude dust and dirt and low power consumption.

The 300 Series is light in weight, small and compact in design, has a switch capacity of 3000 watts per pole with easily mounted-accessible terminals, skip-trip feature, knockouts on both sides, back and bottom, and two bearing plate construction. They are widely used for controlling such devices as blowers and pumps.

Vacuum Gage QC 651

The Alphatron, a new vacuum gage of the ionization type, has a continuous linear response to 10 mm. total pressure. The ionizing agent is a stream of alpha particles emitted by a radioactive source,



permitting operation at any pressure without damage to the gage. The steady emission characteristic of the radioactive element and advanced amplifier design insure great stability and reduce needle flicker to a minimum. The model produced at present by the National Research Corporation covers from 0 to 10 mm. in three ranges, all reading direct pressure. The ranges are 0 to .1 mm., 0 to 1 mm., and 0 to 10 mm. Pressures can be read to one per cent of full scale reading in each case. The gage is ideal for measuring pressures of gases other than air, such as argon, water vapor, and hydrogen, as the linear response of the gage holds true regardless of the atmosphere surrounding the gage.

Vertical Motor QC 652

The Crocker-Wheeler Division of Joshua Hendy Iron Works, announces a new addition to the Company's line of protected-type A.-C. motors. The new motor is a vertical dripproof motor, rated at 40° C rise for continuous duty with a 15 % service factor. It is designed for operation from 60 or 50 cycle, 3 or 2 phase circuits at all standard voltages.

At present a NEMA "B" flange type mounting up to and including the "284" frame, and a NEMA "C" face type mounting up to and including the "326" frame is available.

All ventilating openings of this new line of motors are shielded against the entrance of dripping liquids and falling particles. Oversize ball bearings are provided to carry thrust in addition to the rotor, and the use of the company's patented centrifugal bearing seal permits the use of softer grease for better lubrication and longer bearing life.

A new recessed junction box, which provides ample room for making electrical connections, is employed in the motor's design. The Crocker-Wheeler Alucast rotor, with bars, fans and end rings cast in one operation from aluminum alloys, is used. Other features include: heavy cast frame construction and coils protected with Vinylastic insulation.

Specimen Shear QC 653

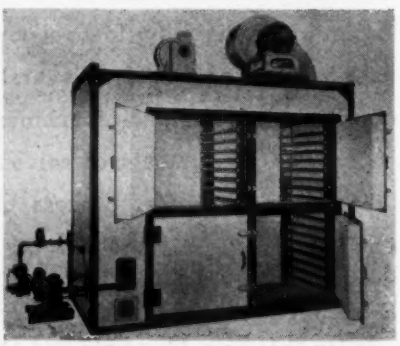
The Taber Instrument Corp. announces the availability of a new specimen shear. This shear was designed for use with the Taber V-5 Stiffness Gauge to assure accurate cutting of test specimens (1½ x 2¾") for uniform and comparable test results. Its use is recommended especially for shearing very thin specimen materials. The shear will cut .020" paper,

plastic or thin metallic sheet and foil in preparation of stiffness or resilience test on the Taber V-5 Stiffness Gauge. A test strip is cut and detached from a sheet in one operation by simply placing the straight edge of the sample sheet against the back gauge of the shear and pushing down with a quick motion.

Cabinet Oven QC 654

To meet requirements for baking or drying operations where quick removal of volatiles is required, a shelf-loading oven with a self-contained heating system has been developed by Gehnrich Oven Division of W. S. Rockwell Co.

The oven is of insulated steel panel construction throughout, the thickness of insulation used depending on the temperature of the process. Firing into a combustion chamber at the left of the processing oven is a line type gas burner connected to a motor-mix proportioning unit, complete with motor and air safety control valves, flameotrol, electrode and spark plug for automatic relighting of the burner.



The combustion and heating chambers are separated by a slotted shield.

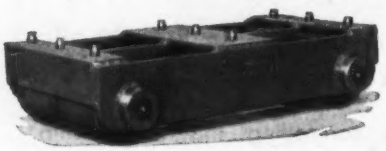
Heat generated by the burner is drawn upward by means of a large recirculating fan mounted on the oven roof which forces the heated air through a duct into a distributor duct at the right hand side of the oven, from which the air is forced through adjustable slide louvres in streams across the full width of the oven, moving uniformly above and below each shelf or tray of work, thence through similar slots into the combustion chamber for recirculation. A motor-driven exhaust fan is also mounted on the roof to draw off

the volatiles as they emanate from the material being heated.

The oven is made with four doors for easy access to any one section of the oven, without unnecessary exposure of the remaining load. Each door is provided with an explosion relief latch. In addition, by interlocking in a fully automatic hook-up all controls for temperature, gas supply, ignition, air flow and motor operation, complete protection is provided for the heating process, product, oven and operators. If electric heating is preferred, electric ribbon heaters can easily be mounted in the combustion space, with connections to required switches and controls. The oven offers uniform baking, drying or curing from 100° to 1000° F.

Dollies QC 655

Techtmann Industries, Inc., announce the development of "Skid-Rol" Dollies.



Obtainable in pairs, Skid-Rols are simple, low-cost dollies for shifting machines, tanks, and other heavy objects—loads from 10 to 12 tons. Sturdy steel cleats imbed into the wood skids and carry the load only a few inches from the floor with safety and ease, eliminating the hazards involved in handling wooden rollers. Personal injury cases are reduced to a minimum and accidents due to passing and positioning rollers are avoided.

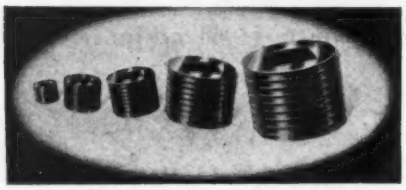
Each dolly is 18½" x 10½" x 4" high and equipped with four all-steel rollers 3¼" in diameter. Roller bearing are lubricated through Zerk fittings.

If inverted, Skid-Rols can be used for a standing dolly for moving steel beams and girders.

Plastic Pipe Seals QC 656

Plastic pipe seals and thread protectors in countersunk pattern are now announced by American Molded Products Company, giving users a choice between a countersunk and square head pattern.

The strength and lightness, as well as the toughness of plastic make it preferred



material for pipe seals and thread protectors. Plastic can take accurate and durable threading, is non-corrosive, and excludes moisture, oil, dirt, grit, etc.

The square sockets of American Molded's new countersunk pattern are of dimensions to fit commercial square bars of standard sizes. Dimensions are the same as the maximum size of cold rolled square steel bars given in A.S.T.M. Specifications. The sizes available are ⅛", ¼", ⅜", ½", ¾", and 1".

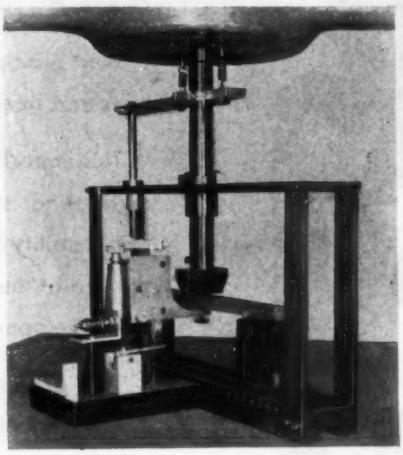
Aprons QC 657

A new line of aprons in white synthetic rubber has been announced by Industrial Products Co. They are practical for laboratory technicians, food and drug handling, and other operations where a sanitary appearance is desired.

One style is finished with four grommets for attaching the tie strings, while two other styles are complete with adjustable straps. Snap buttons on one style permit the apron to be opened up flat for cleaning.

Deflectometer QC 658

The Southwark Division of the Baldwin Locomotive Works has developed a combination flexure tool and deflectometer for testing molded plastics, plastic laminates, and woods. The new instrument



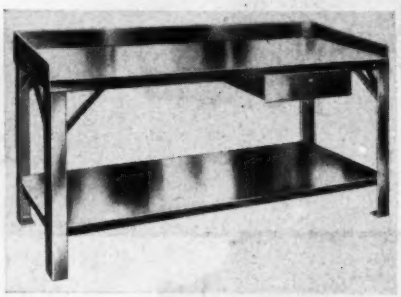
will make tests in bending in accordance with the latest federal specifications and those of the A.S.T.M., and will fit any testing machine.

The deflectometer measures the deflection from the center of the specimen and conveys this to an autographic stress-strain recorder which gives the load deflection curve. One of the important features of this instrument permits the operator to adjust the magnification of the deflection in multiples of 5, 10, 20, 50, 100 and 200 times. The high magnification ratio is used for very stiff and brittle materials that deform only slightly before breaking. The deflection, therefore, is measured in terms of thousandths of an inch. The low magnification permits recording large deflections which may be as much as two inches with very flexible materials.

In order to obtain tension, compression and flexure characteristics of the various plastic materials under extreme temperature conditions, the instrument has been designed to fit inside a cabinet in which the temperature can be controlled. The deflectometer will operate from —70° to +170° F. Since a certain ratio must be maintained between the length and thickness of the specimen under test, the span is adjustable. The loading nose is guided so it will travel in a true straight line.

Package-Type Work Bench QC 659

Sturdier construction and numerous available extras are the features of the improved Equipto 12-gauge steel work bench announced by Equipto, Division of



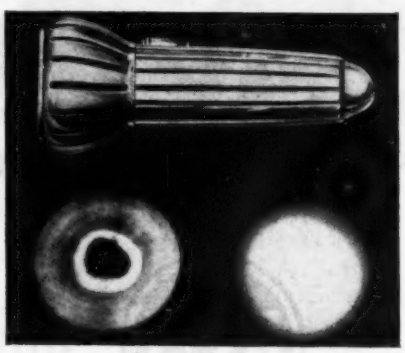
Aurora Equipment Co. It may be furnished without back and side railings for use as a packing bench.

All four flanges of the bench are formed into a boxed edge for utmost rigidity. A second 12-gauge steel plate may be tack welded onto top for vise reinforcement. The bench is highly suitable for both work bench use and for supporting light machine tools. The four feet have holes to permit fastening to floor if desired. It is available in 42" and 6' lengths, 34" high and 28" deep.

It can be furnished as a plain work bench with 12-gauge steel top and with bottom tray, back and side railings, drawers with padlock attachment, adjustable 3-compartment tray for drawer. The benches may be used side by side and back to back forming larger working surfaces in a minimum of floor space.

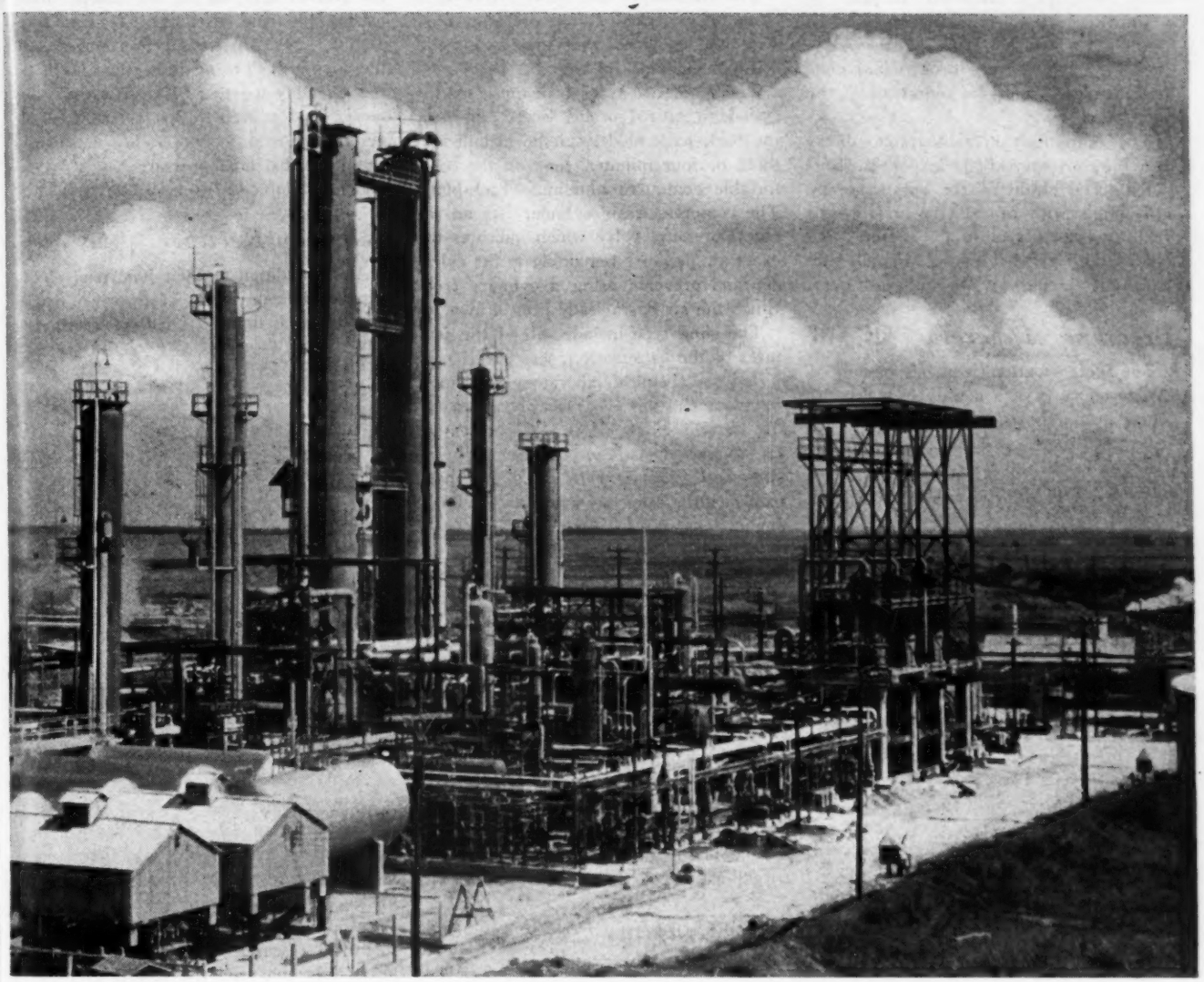
Light Reflector QC 660

A light reflector of entirely different design is announced by the General Detroit Corp. and the General Pacific Corp. By means of a new principle of light reflection, it eliminates the "dark spot" produced by conventional reflectors. Called the Diamond Facet Reflector, it



is made for use in flashlights, searchlights, lanterns, spotlights, and floodlights of all sizes and types.

The Diamond Facet Reflector's design makes use of the fact that nothing re-



One of more than a score of HF alkylation plants contributing to the production of fighting-grade aviation gasoline.

HF Alkylation Plants agree on Porocel

• Most HF alkylation plants now producing high-quality alkylate for 100-octane aviation gasoline use Porocel for the final purification of the product. In every case, this activated bauxite adsorbent has proved its superior ability to defluorinate the product to rigid specifications.

• We are proud that Porocel has been able to make this vital contribution to the refining of super-gasoline for America's warplanes. It is one example of Porocel's many-sided usefulness in improving quality and cutting refinery costs. Its value will grow in the time ahead, as high quality and low cost become increasingly important.

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POROCEL CORPORATION • BAUXITE ADSORBENTS AND CATALYSTS

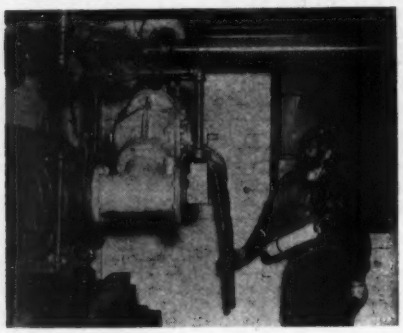
flects light like a diamond. In place of a smooth wall finish which causes light beams to clash with one another, this reflector has a surface broken into multiple diamond shapes to reflect all of the light.

The unretouched photograph shows how the conventional "dark spot" is eliminated. The circle on the left, made by a flashlight with an ordinary smooth-wall reflector, has a spot in the center. The one on the right, made by a "Floodbeam" flashlight, is pure white light all over.

Breathing Apparatus QC 661

The Scott Aviation Corp. has announced the introduction of a new type of breathing apparatus for use in the chemical field. It is called the Scott Air-Pak.

The Air-Pak utilizes normal breathing air—not oxygen—stored under pressure



in a compressed air cylinder, with the result that pure breathing air can be carried to the hazard and not drawn and refined at the scene.

Also the Scott Air-Pak is ready for instant use. All that is necessary is to don the apparatus and enter the area of hazard. The Scott Air-Pak, according to company officials, offers other advantages such as its Quick-Connect, which permits the wearer to breathe through the open end of the low pressure face mask hose until entering the danger zone, thus conserving the air supply for actual use under working conditions. This feature is believed not available in any other breathing equipment today.

The Scott Air-Pak utilizes the well-known Willson mask. The Willson mask includes among its features shatter-proof lenses cushioned in rubber designed to allow full unobstructed vision in all directions: up, down, to the right or left. The fresh, cool, breathing air drawn into the mask eliminates all lens fogging and the completely efficient exhalation valve prevents the accumulation of dangerous gases inside the mask.

The demand-type regulator is for all intents and purposes the same as that employed by the Army. Integral with the demand-type regulator is a pressure gauge showing the exact amount of air remaining in the compressed air cylinder at all times. This gauge is furnished with luminous figures and can readily be seen under all normal working conditions.

The harness of the Scott Air-Pak is made of neotexed cotton webbing 2½" wide and equipped with snap hooks and self-locking slide buckles.

There are two types of compressed air cylinders utilized in the Scott Air-Pak: the back pack model can be installed in three or four minutes' time on the comfortable contoured aluminum back-plate. The compressed air cylinder has an integral pressure valve which indicates the exact air pressure remaining in the cylinder and prevents using a cylinder from which the air has already been drawn.

The sling type includes all of the features of the back pack model but is preferred for chemical laboratory work and for instant use in all areas where breathing hazards exist. It is ideal equipment for factory installation at fire fighting stations. Special wall cases for permanent installation are available for these applications.

Tank QC 662

The D. C. Cooper Co. has announced the development of the new Double Victory Tank, two complete tanks in one. One side is used for cleansing materials, the other for rinsing, or one side can be used for wax and the other used for rust preventive solutions. The tank is electrically heated, each side having separate heating elements, thermostat, thermometer, and brass drain cock and overflow drain. The liquid capacity of each side is 20 gallons.

Hose Coupling QC 663

The E. B. Wiggins Oil Tool Co., Inc., has announced the development of a new industrial hose coupling made of lightweight aluminum with only two moving

parts and built to withstand a pressure of 600 lbs. per square inch.

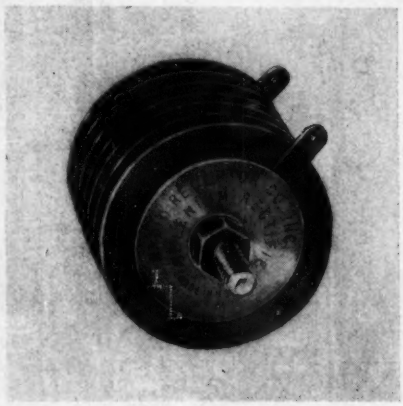
The new two part unit includes a threaded end section that applies on a standard threaded faucet and a ring equipped section for application in the end of a length of hose. The ring is pulled back by a spring and moves axially over a set of hinged dogs. It is knurled to provide an operating grip.

Moving the ring back against the spring permits the dogs to swing open and clear a holding ring integral on the shank of the section applying on the faucet. Releasing the ring after the two coupling sections have been brought together, closes the dogs inward to grip the ring and hold the assembly together. The shank on the faucet section rides inside a rubber gasget in the ring section to prevent leakage at normal hose pressure.

It is available in two sizes: ⅝" and ¾".

Selenium Rectifier QC 664

As an addition to their industrial electrical equipment, Radio Receptor Co., Inc., announces a line of selenium rectifiers



which meet every requisite for a modern a.c.-to-d.c. conversion unit.

High efficiency, stability, long life, compactness and an almost total absence of maintenance costs have long characterized selenium rectifier performance, as evidenced by their extensive use by the Armed Forces. Radio Receptor Co., after intensive research for more than two years, has enhanced the appeal of these units by utilizing, in the main, aluminum in place of iron or similar metals, and by developing a method of sealing the unit hermetically, thereby assuring maximum performance under all climatic conditions, ranging from the Arctic to the Tropics.

The use of aluminum reduces the unit weight by two-thirds and at the same time enables vastly more efficient heat dissipation and provides for an increased margin of protection beyond normal plate rating.

This new line embraces a wide range of units—from 25 mils up to capacities of hundreds of amperes—thus offering an efficient unit for every industrial application, for all combinations of voltage and current outputs and for various types of circuits. To name only a few specific applications, selenium rectifiers are used extensively for battery charging, relay circuits, welding, and electroplating.

Selenium rectifiers, as compared with other types of dry-disc converters, have the advantage of enabling efficient operation at higher ambient temperatures, of being less susceptible to moisture, more stable, and displaying improved aging characteristics. Units that have been in service for more than a decade give evi-

It slams the door on fire!

WHEN fire breaks out in a room housing flammable liquids or electrical equipment, the Kidde fire-extinguishing system works at top speed . . . and efficiency . . . whether the room is open or closed.

But often, the safety of nearby workers — or the protection of adjacent equipment — calls for a still further precaution — *complete isolation* of the room itself.

Kidde equipment can do that job too!

Pressure of the same carbon dioxide that smothers the flames actuates trips that allow fire doors and windows to close. Pressure-operated switches turn off ventilating fans . . . shut down machinery. When protected spaces are occupied time delay mechanisms are provided to permit exit from the space before extinguishing takes place.

Meanwhile the carbon dioxide gas, penetrating every corner of the room, kills the blaze in a matter of seconds.

There may be a room in your plant that calls for this combination of fast fire-fighting and automatic isolation. Or other fire hazards that can best be protected by Kidde portables, wheeled units, local application systems. Ask a Kidde representative to recommend the *right* protection for each danger area in the accompanying list.

* * *

KIDDE KILLS TOUGH FIRES *in Process Rooms, Mixing Tanks, Agitators, Pump Rooms, Storage Areas, Drum-Filling Rooms, Motors, Transformers, and Electrical Control Panels.*

Walter Kidde & Company, Inc., 1127 Main Street, Belleville 9, New Jersey

K Kidde

The word "Kidde" and the Kidde seal are trade-marks of Walter Kidde & Company, Inc.

Kidde

dence that this type rectifier will serve at least fully as long as other circuit components.

Proportioning Pump QC 665

%Proportioneers, Inc.% has just announced a new package-type proportioning pump to add colloid and phosphate for maintaining maximum heat transfer in marine evaporators by keeping tubes free from incrustation. This unit includes a spill-proof solution tank, sight glass, cover and motor-driven agitator. The chemical feeder, a %Proportioneers% Midget Adjust-O-Feeder with fluid sealed plunger and stuffing gland, assures extremely long life and satisfactory performance when handling any chemical. The agitator and pump are driven with a single motor. All parts are readily interchangeable for ease of maintenance.

Germicidal Lamps QC 666

Germicidal lamps, providing effective ultraviolet radiation to destroy airborne bacteria and to prevent contamination of foods and sterilized articles, are now available from Sylvania Electric Products Inc. Two types are offered in 15 and 30 watt T-8 sizes. Type A is suitable for schoolrooms, homes, and hospitals. Type B is suitable for air conditioning ducts, food packaging, bottle and jar filling operations and other applications where there is air turbulence, exhaust canopies, or provision for worker protection against the higher ozone output of Type B lamps.

Irradiating the upper third of a room where people are exposed for even short periods is necessary. Germicidal lamp applications should eliminate direct viewing by the naked eye. Indirect systems of radiation produce best results when aluminum or polished chrome reflectors are used to shield the lamps from the eye and to reflect ultraviolet rays upward efficiently. Both Type A and Type B germicidal lamps are rated at 2500 hours life and may be operated with the conventional ballasts, sockets, and starters used with standard 15 and 30 watt fluorescent lamps.

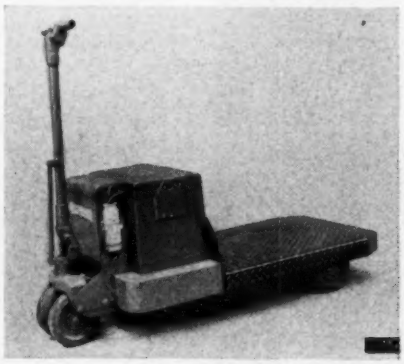
Feeder Control QC 667

Hammer mills, attrition mills, and cutters are able to handle full production loads, thanks to a new electronic feed regulator. Heretofore it has been necessary for the operator to watch feeding and to manually regulate the feed to avoid overloads and mill choke up. The electronic regulator, on the other hand, maintains the load on pulverizing equipment at the maximum rated capacity of the connected motor.

New improved design prevents momentary overloads from actuating or disturbing the feed control relay. An underload light signal indicates failure of material to reach pulverizer due to empty bins or arching at some point in the flow above the feeder. Additional light or sound signals can be wired to any required location. The manufacturer, Mosher Electronic Controls, estimates that production increases of from 20 to 35% are obtainable from each mill.

Industrial Truck QC 668

A new motorized load-carrying truck has been announced by Lift Trucks, Inc. The new truck is not a lift truck—the



bed is stationary. Its safety rated capacity is 4000 lbs. Finger tip control permits easy maneuvering. The finger tip control consists of two buttons on the handle, one for forward motion, and one for reverse, operating in conjunction with an Allen-Bradley controller unit.

The truck has a forward or reverse speed of 312 feet per minute when empty, and 220 feet per minute when loaded. The power is generated by heavy duty batteries which are reported to operate up to 20 hours under maximum load without recharging.

Angle Compressor QC 669

The Clark Brothers Co. has recently presented the new Clark "BA" 17 gas engine driven angle compressor. The compressor has a 17" bore and 17" stroke and develops 200 brake horsepower per cylinder. The new compressor is useful for installations requiring a large amount of power and develops more horsepower per unit of space than any other gas engine driven compressor, according to the manufacturer.

Portable Beam Scale QC 670

A modernized portable beam scale, Model No. 54, is offered by The Howe Scale Co., incorporating important advantages. For quicker reading graduations are die-cast on the lower edge of the beam on this scale where they shine out against a dark red background. The possibility of errors in reading is still further minimized by a center-indicating poise with a non-removable set screw. Both beam and poise are die-cast from corrosion-resistant metal. Wheels are so designed that the ends of the axles are enclosed and do not project to tear clothing or bags.

Sustained accuracy over long periods of service is achieved by a special Howe

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In reconverting, many factories can plan to increase profits by eliminating preventable shipping losses—through use of the Signode Methods of Steel Strapping. Along with greater protection to shipments, you get reduced costs in the shipping room, and, possibly, savings through lower freight rates.

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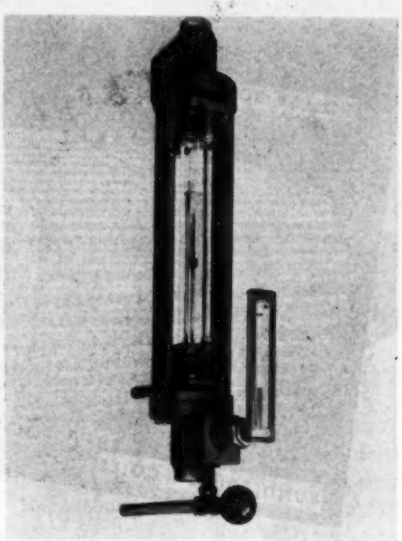
All men and women who are honorably discharged from the armed forces will wear this button. Join in saying to them, "Well done and welcome home!"

feature—four ball bearings set between the platform and the pivot bearings, which absorb the brunt of platform movements. Other features include heavy cast levers with extra size pivots and bearings made of specially tempered tool steel; interchangeable pivots; and self-aligning load bearings suspended in forged loops which allow complete contact of bearing and pivot knife edges at all times. The platform is cast in one piece, while an extra-long skirt keeps dust and dirt out of the scale mechanism. Two steel braces hold the pillar sturdily in position.

The No. 54 is available with either a single beam graduated 100 by ½ pound, a double beam similarly graduated, or a full-capacity beam graduated 100 by ½ pound on the upper bar and 100 to 1,000 pounds on the lower bar. A drop lever, pillar guard, and balance indicator can also be furnished for this model.

Specific Gravity Indicator QC 671

A new specific gravity indicator has been announced by the Schutte & Koerting Co. By permitting continuous indication



of a flowing sample, the time-lagging, often troublesome, intermittent sampling method is eliminated.

Flow to the SK specific gravity indicator is regulated by a valve. Liquid rises in the heavy-walled glass tube to a height determined by outlet pipes, overflows and is returned to the process. Specific gravity is indicated on a standard hydrometer within the tube. An integrally mounted thermometer provides for temperature measurement when hydrometer is read.

An adaptation of the SK Universal Rotameter can be very readily installed in new or existing pipe lines. Both inside and outside cleaning is easily accomplished without disturbing pipe connections. Packing glands are adjusted by cap screws and there are no large threads to corrode and freeze. While normally supplied in bronze, it may be obtained in any alloy on special order.

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HANDLING—the Common Denominator of PRODUCTION

LET MEN DIRECT POWER—NOT GENERATE IT!

Cubic transportation—Lifting and placing as well as carrying—is essential to efficient handling. *Where* a product is handled is just as important as *how* it is handled.

Towmotor, capable of moving materials in any plane from floor level to a 20 foot height, provides a means of utilizing all available space. The Towmotor DATA FILE contains details. Your copy is ready now.

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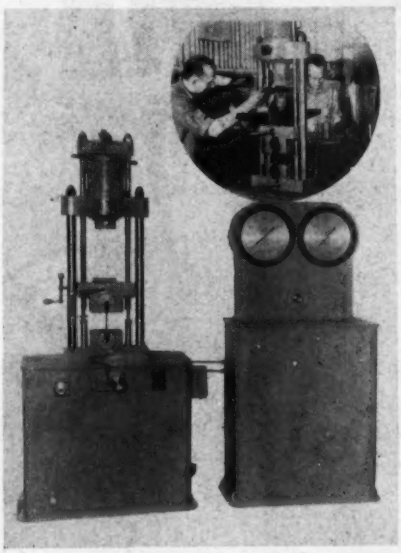
Testing Machine QC 672

A hydraulically operated machine designed for the making of tensile, transverse and compression tests up to 60,000 pounds is announced by Steel City Testing Laboratory. The piston and cylinder are a lapped finish, carefully fitted without any packing, allowing for a minimum of friction. The pulling head unit thrust is taken on a large steel ball and socket which allows the head to float. The upper and lower pulling heads are of the conventional type with wedge type jaws for both flat and round specimens. Holders are also available for shoulder and thread end specimens. A suitable load regulating valve is provided which will maintain a uniform load rating. Any load can be held for any period by the operator.



The gauges are provided with maximum pointers and both gauges are fully protected against overload and gauge selector valve is provided. A maximum stroke of 6″ is provided in the cylinder. The transverse table has a span of 30″.

Strainer QC 673

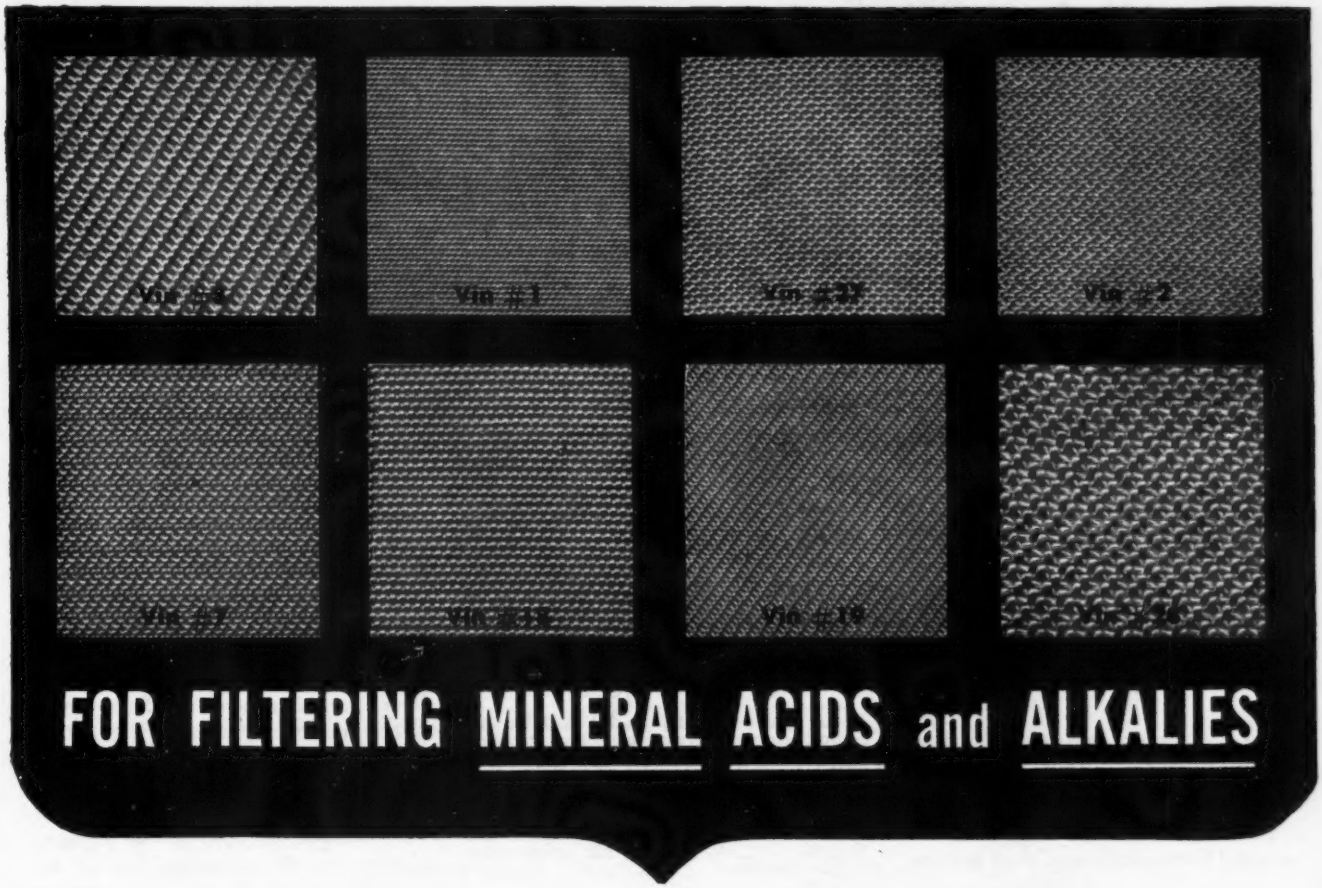
The new Blackmer Low-Swing strainer, developed by Blackmer engineers as a wartime protective and conservation measure for critical pumping equipment, has been added to the company's line of Ezy Kleen strainers.

Field reports show the following advantages:

1. Use of perforated metal, steel or bronze, instead of wire screen for the strainer basket makes the basket less liable to damage in cleaning and gives it longer life.
2. Slotted lugs of the top plate line up with the lugs of the strainer body to receive the four holding bolts, permitting quicker removal of basket for cleaning.

Present production is limited to a capacity of 100 GPM with 2-in., 2½-in., and 3-in., intake and discharge sizes. Maximum operating temperature is 600°F. and maximum pressure is 75 psi.

VINYON* FIBER



FOR FILTERING MINERAL ACIDS and ALKALIES

FILTER FABRICS

If you have a filter fabric problem in connection with any of the processes or products listed below, Vinyon fiber filter fabrics may be the solution. Subject always to certain heat limitations, Vinyon is highly resistant to corrosive fluids.

Perfected and developed through careful field studies, Vinyon fiber filter fabrics are now solving many problems in the filtration of mineral acid and alkali solutions.

Longer life, higher efficiency and therefore ultimate economy are characteristic of Vinyon fiber filter fabrics that will be of interest to you. The engineers on our staff are in a position to discuss with you the possible application of Vinyon fabric to your particular problems. When writing please include all information regarding your present filtration process.

*Reg. Trade Mark C. & C. C. C.

- Pigments and Dry Colors
- Pharmaceuticals
- Metallurgical Processes
- Salt Solutions
- Electroplating Processes
- Dyes and Intermediates
- Mineral Acid Solutions
- Strong Alkali Solutions
- Bleach Liquors
- Ceramics

BUY MORE WAR BONDS

WELLINGTON SEARS COMPANY, NEW YORK, N. Y.

PACKAGING & SHIPPING

by T. PAT CALLAHAN

ICC Regulations Amended

The Interstate Commerce Commission Regulations for the Transportation of Explosives and Other Dangerous Articles were amended on August 22, 1945, to include vinyl chloride, inhibited.

T. Pat Callahan

Vinyl chloride, inhibited, under the regulations is classed as an inflammable gas, requiring a red label, and the maximum amount which can be packaged in one container for express shipment is 20 pounds.

Section 303, paragraph (k) is amended by the addition of the following:

Amending par. (k), *sec. 303*, order Aug. 16, 1940, as follows:

Kind of gas	*Maximum permitted filling density (see sec. 303 (h))*	*Cylinders* marked as shown in this column must be used except as provided in Note 1 and sec. 303 (p) (2) to 303 (p) (6)*
(Add) Vinyl Chloride, Inhibited (See Note 7)	Per cent 84	ICC-4B300, without brazed seams; ICC-3A300; ICC-25

(Add)
Note 7. All parts of valves and safety devices in contact with contents of cylinders must be of steel or must be suitably treated to prevent possible formation of copper acetylide.

Paragraph (q) (1), Section 303, is amended by the addition of the following:

Name of gas	*Maximum permitted filling density (see Note 1)*	*Required type of tank car, Note 2*
(Add) Vinyl Chloride, Inhibited (See Note 16)	Per cent 84 87	ICC-106A500 Note 12 ICC-105A300

(Add)
Note 16. All parts of valves and safety devices in contact with contents of tank must be of steel or must be suitably treated to prevent possible formation of copper acetylide.

Note 12 to paragraph (q) (1), section 303, is amended as follows:

Note 12. Tanks complying with specification 106A500, containing chlorine, anhydrous ammonia, sulfur dioxide, methyl chloride, dichlorodifluoromethane, monochlorodifluoromethane, monochlorotetrafluoroethane, *vinyl chloride, inhibited,* may be transported on trucks or semi-trailers only, when securely chocked or clamped thereon to prevent shifting, and provided adequate facilities are present for handling tanks where transfer in transit is necessary. See par. (b) (2), sec. 560 for rail freight-motor vehicle shipments.

In part 7 of the regulations applying to shipments made by common contract or public carriers by public highway, paragraph (g) (3), section 824, is amended as follows:

(g) (3) Tanks complying with specification 106A500, containing chlorine, anhydrous ammonia, sulfur dioxide, methyl chloride, dichlorodifluoromethane, monochlorodifluoromethane, monochlorotetrafluoroethane, or *vinyl chloride, inhibited,* may be transported on trucks or semi-trailers only, when securely chocked or clamped thereon to prevent shifting, and provided adequate facilities are present for handling tanks where transfer in transit is necessary. See par. (b) (2), sec. 560 for rail freight-motor vehicle shipments.

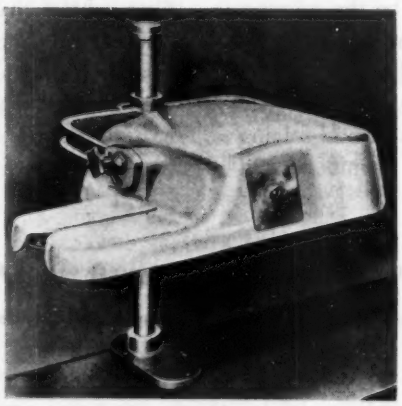
Sealer for Plastic Packaging

A new process for welding plastics or foil for heat seal packaging is announced by Sav-Way Industries, Detroit, with introduction of the Sav-Way Heat-Sealer now in production for commercial use to provide air-tight and moistureproof packaging.

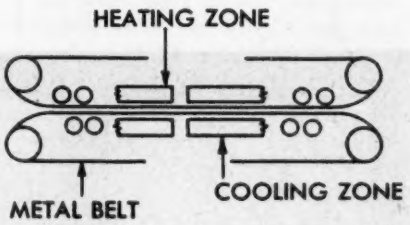
The new machine is designed to handle both plastic film and foil and Grade C sealable paper, wax impregnated or wax coated, widely used for overseas shipment of war materials.

Packaging by the Sav-Way process was developed to protect war materials like instruments, guns and gun parts, and even complete engines that had to withstand possible immersion in salt water, tropical heat or Arctic cold, and the attack of fungi in tropical climates. The process today is adapted to use for any item that needs to be protected against deterioration until it is used.

Exclusive features of the new Sav-Way design assure strong, uniform welds by



accurate control of three factors: temperature, pressure and speed. An electronic temperature control holds heater bars within one degree up to 500 degrees Fahrenheit. Steel belts carry the material to be welded between the heater bars from 10 to 38 feet per minute at controlled pressure and through a cooling zone, all in one operation. Pressure between heater bars is adjustable and held



by spring tension to precise limits, and the bars are so mounted as to be self-aligning, assuring precision alignment at all times. Wiper type oilers of heavy felt are provided to wipe the metal belts and prevent them from sticking.

New Products and Processes

(*Continued from page 877*)

carbonate or a mixture of calcium and magnesium carbonates at high temperatures with a mixture of ammonia and carbon dioxide.

In the first experiments, which were carried out with finely powdered calcspar and a reaction temperature of 800° C. and with a gas mixture consisting of 95 per cent of ammonia and 5 per cent of carbon dioxide, a cyanamide yield of 92-94 per cent was obtained. When the experiments were repeated with ordinary ground limestone, much lower yields of cyanamide were obtained, ascribed by the Japanese workers to the decomposition of the ammonia into hydrogen and nitrogen under the catalytic influence of the traces of iron oxide present in the limestone. This adverse influence of the iron oxide can be obviated in two ways, either by the addition of small amounts of calcium sulphate or calcium sulphide to the limestone or by the addition of small quantities of carbon bisulphide or hydrogen sulphide to the gas mixture used in the reaction.

Wrinkle Finish NP209

New Wrinkle, Inc., of Dayton, Ohio, announces a research development which has been made available to its licensees, a new synthetic resin base wrinkle-finish composition that needs no cooking. As a result, marked economy in time of manufacture is effected.

The new material can be applied in any desired textures by spraying, spreading or rolling. The unusual flexibility of the resulting product makes it possible to apply such wrinkle finishes to paper, cloth, felt and other flexible materials as well as to metal.

The Four Freedoms of Peacetime Packaging

as pointed out by Multiwall Paper Valve Bags

1 *Freedom from siftage losses.* Multiwalls are made from 2 to 6 plies of tough, specification-made kraft paper. These tight packages eliminate siftage losses. They also cut retention losses and help keep storerooms neat and tidy.

2 *Freedom from dampness losses.* Multiwall Paper Bags are moisture resistant. They protect against damage caused by dampness as well as smoke, dust, and contaminating gases. Multiwalls also offer protection from insect infestation.

3 *Freedom from extra bookkeeping.* Multiwall Paper Valve Bags eliminate the bother of collecting, storing and keeping tabs on returned bags or containers. Multiwalls are single-trip packages . . . once they deliver your product, you have no bother about "returns."

4 *Freedom from bag-cleaning problems.* Because Multiwalls are only used once, food manufacturers have no problems concerning the cleaning or disinfecting of returned bags. New Multiwalls are always spick and span.

IN ADDITION, Multiwall Bag-filling Machines save time, labor and equipment. Let us tell you more about how Multiwalls are serving manufacturers in your industry. There is no obligation, simply write or call your nearest St. Regis office today.

St. Regis MULTIWALL PAPER BAGS

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

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Los Angeles Nazareth, Pa. New Orleans No. Kansas City, Mo. Seattle Toledo

BOOKLETS & CATALOGS

Chemicals

A853. ALIPHATIC SULPHUR CHEMICALS. The Chemical Production Department of the Phillips Petroleum Co. has issued a 4-page leaflet (No. 118) describing the various mercaptans and disulphides which they are producing either on an experimental or commercial basis.

A854. CELLULOSE ACETATE. The Hercules Powder Co. has just issued a 36-page revised edition of their technical reference booklet on cellulose acetate.

A855. ELASTICATOR. "Circosol-2 KH—An Elasticator" titles a booklet describing a new aid to rubber processing developed by the Sun Oil Co.

A856. FLOOR POLISHES. The methods of preparation of water resistant dustless floor polishes are given in a 4-page leaflet (F-5681-A) of the Carbide and Carbon Chemicals Corp.

A857. MERSOLITE. The Mersolites, phenyl mercuric compounds, are discussed in a 24-page booklet. F. W. Burke and Co.

A858. ORGANIC CHEMICALS. The Carbide and Carbon Chemicals Corp. has just published the 12th edition of their general catalog, "Synthetic Organic Chemicals."

A859. PETROLEUM PRODUCTS. L. Sonneborn Sons, Inc., have issued a new series of 18 technical data files on specific uses of refined petroleum products for various industrial fields.

A860. PLASTIC MOLDING MATERIALS. The Society of Plastics Industry, Inc., has just issued a chart giving a classification of both thermosetting and thermoplastic molding materials.

A861. PLASTICS. "Durez Coating Resin" titles a 12-page booklet recently issued by Durez Plastics and Chemicals, Inc.

A862. RESINS. Heresite plastic coatings, synthetic resins and molding compounds are described and pictured in a 42-page booklet of Heresite and Chemical Co.

A863. SILICONES. The Dow-Corning Corp. has just issued a 12-page general catalog describing the various silicone fluids, rubbers, greases and compounds, varnishes and resins which they now produce.

A864. THANITE. The Hercules Powder Co. has issued an 8-page booklet, titled "Why Thanite," describing the use of isobornyl thiocyanoacetate as a toxicant.

Equipment—Methods

F499. AIR CONDITIONING. The W. B. Connor Engineering Corp. has issued a 12-page folder, describing the application of Dorex air recovery equipment to existing systems.

F500. ANGLE COMPRESSOR. Clark Brothers Co. has issued a 16-page bulletin, describing the new Clark "BA" 17 gas engine compressor.

F501. ATLANTA. The Atlanta Chamber of Commerce has recently issued a new edition, "Facts in Figures About Atlanta."

F502. BELLINGHAM, WASHINGTON. "Profit for Your Industry" titles a 56-page book, issued by the Bellingham Chamber of Commerce, giving descriptive and statistical data concerning the resources of Whatcom County in the State of Washington.

F503. BREATHING APPARATUS. Scott Aviation Corp. has issued an 8-page illustrated booklet covering all series of the new Air-Pak breathing apparatus for use in and around the plant wherever poisonous gases may collect.

F504. CHAIN BELTS. A new 12-page bulletin (No. 455) on Rex and Baldwin-Rex Oil Field Products have just been released by the Chain Belt Co.

F505. CONTAINERS. Information concerning containers designed by General Box Co. is included in a recent booklet.

F506. CORROSION OF NICKEL. "The Resistance of Nickel and Its Alloys to Corrosion by Caustic Alloys" titles a 20-page bulletin (T-6) of the International Nickel Co., Inc.

F507. DIESEL ENGINE CONTROL. Viking Instruments, Inc., has issued a 2-page leaflet (R-18) describing the new safety control system for the shut down of Diesel engines when the temperature of the circulating water system becomes too high.

F508. ELECTRICAL CONTROLS. Catalog and price sheet (4591—C) United Electrical Controls Co.

F509. EQUIPMENT. The types of equipment produced by Dresser Industries, Inc., is described in a recent 10-page booklet.

F510. HEAT TRANSFER EQUIPMENT. Kettles, heat exchangers and other heat transfer equipment are the subject of an 8-page booklet (No. 103-K) of the Patterson-Kelley Co., Inc.

F511. LABORATORY APPARATUS. Catalog. New York Laboratory Supply Co.

F512. VALVE LUBRICANTS. A new and completely reedited manual (No. V-105) featuring the uses of valve lubricants in lubricating plug valves has been issued by Merco Nordstrom Valve Co.

F513. VALVES. "Powell Valves for Corrosion Resistance" titles a 20-page catalog of Wm. Powell Co.

F514. VERTICAL COKE OVENS. "The Flow of Air and Gas in Vertical Flue Coke Ovens" titles a technical bulletin of the Wilputte Coke Oven Corp.

F515. WATER DEAERATION. "Cold Water Deaeration" is the subject of a 4-page reprint (No. 43) of the Cochrane Corp.

F516. X-RAY SPECTROMETER. "Engineering in Design and Development of X-Ray Spectrometers" titles a new 12-page booklet recently issued by North American Philips Co.

CHEMICAL INDUSTRIES TECHNICAL DATA SERVICE

Chemical Industries, 522 Fifth Ave., New York 18, N. Y. (11-5)

I would like to receive the following free booklets or catalogs.

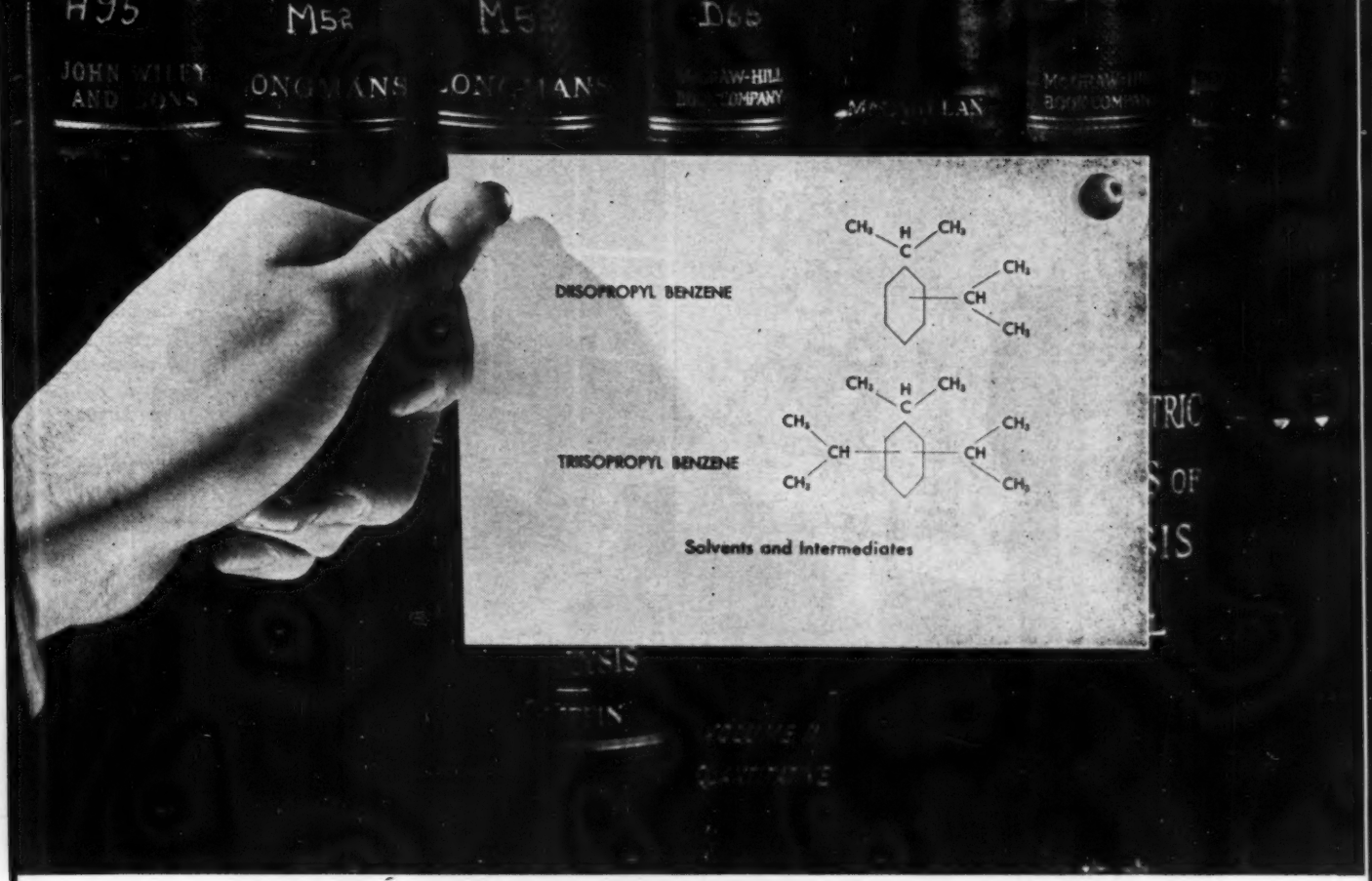
A853	A858	A863	F502	F507	F512
A854	A859	A864	F503	F508	F513
A855	A860	F499	F504	F509	F514
A856	A861	F500	F505	F510	F515
A857	A862	F501	F506	F511	F516

Name ..... **(Position)** .....

Company .....

Street .....

City ..... **Zone** ..... **State** .....



selected this month from the Dow "library" of special chemicals

From its varied collection of the lesser known chemicals, Dow highlights this month two interesting selections . . . Diisopropyl Benzene and Triisopropyl Benzene. These compounds are essentially solvents and intermediates. A review of their properties may well suggest new potentials for your own development work.

Both Diisopropyl Benzene and Triisopropyl Benzene are available in 55-gallon drums. Dow will gladly furnish samples for investigational purposes at your request.

Special Chemicals

PROPERTIES

	Diisopropyl Benzene	Triisopropyl Benzene
Boiling range, 5-95%	203.3°-206.3°C.	230.0°-239.0°C.
Specific Gravity, 25/25°C.	0.871	0.856
Freezing Point	< -40°C.	About -30°C.
Refractive Index at 25°C.	1.492	1.488

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DOW

CHEMICALS INDISPENSABLE TO INDUSTRY

"Deep breathing might have something to do with it"

SURPRISINGLY enough, people bring similarly tidy problems to us. As when a manufacturer of calcium hypochlorite had difficulty packaging his product.

This chemical is unstable, corrosive, sensitive to moisture, and is required to be packaged in resealable cans. This presented a packaging problem for which no satisfactory container had been developed. Could we fix?

Well, we could try . . . Yep, we came through—by designing the "breather can"—a moisture-repellent container which incorporated means for the gases to "breathe," and a lacquer to retard chemical action.

"Cangenuity," our ability to combine ingenuity with can-making experience, is one of the many ways you profit when you deal with Crown. And it's a good place to start. If you have packaging trouble, tell us your symptoms.

CROWN CAN

INDEPENDENT AND HELPFUL

CROWN CAN COMPANY • NEW YORK • PHILADELPHIA • Division of Crown Cork and Seal Company, Baltimore, Maryland

NEWS OF THE MONTH

Research Corp. Offers $2,500,000 in Grants

$2,500,000 is being offered in grants to educational institutions by Research Corp., of New York, a non-profit organization devoted to advancing research and technology by use of revenues from inventions assigned to it by public-spirited inventors. Through these funds scientists who made the atomic bomb, radar, and a host of other vital war weapons will have a chance to return promptly to college laboratories for scientific research and teaching.

Preference in making these grants will be given, other factors being equal, to smaller institutions and those of more limited financial resources for research. The five-year program announced by Joseph W. Barker, acting president, who has returned to his duties with the corporation and with Columbia University from services as special assistant to the secretary of the Navy, will result in 100 to 200 grants of $2,500 to $5,000 each year in order that talented young scientists will be able to undertake research of peacetime importance in pure science, especially chemistry, physics, mathematics and engineering.

The first grants will be made in a few weeks by a special committee of scientists from industrial and university laboratories.

National Council to Guard Patents

A new organization of smaller manufacturers has launched a nation-wide program in defense of the U. S. patent system. Incorporated as the National Patent Council, it will operate with headquarters at Gary, Ind., and branches in New York and on the Pacific coast. John W. Anderson, president of The Anderson Co. of Gary, has been named president of the council.

James L. Straight has been appointed western division executive director of the council.

Tax Reduction Will Aid Chemical Industry

The chemical industry will be one of the chief beneficiaries of the easing of excess profits taxes. At least a reduction in the levy, and perhaps a complete repeal, appears to be assured for 1946. Leading chemical producers have on the average almost doubled their sales in the four years of war and operating earnings increased even more. Because of taxes, however, net earnings per share were about the same each year during the war.

Nearly all leading companies are planning important plant expansions. DuPont has placed contracts for at least $40 million in new capacity.

The chemical industry is expected to retain most of its sales gain, unless the industrial reconversion program falls down completely. Many important new chemicals have been developed and many others which were just beginning to find markets before the war have found widespread general use in industry. There is said to be a large backlog of civilian demand awaiting these newer materials.

Coghill Joins Abbott

Robert D. Coghill has been appointed associate research director of Abbott Laboratories, according to E. H. Volwiler, vice-president in charge of research and development. Since 1939 Dr. Coghill has been Chief of the Fermentation Division, Northern Regional Laboratory, U. S. Department of Agriculture, Peoria, Ill., where he was connected with the problem of penicillin production.

Textile Mill Acquires Skenandoa Rayon

Control of the Skenandoa Rayon Corp., of Utica, N. Y., has been relinquished by the St. Regis Paper Co. to Beaunit Mills, Inc., of New York, it was announced on October 2, by Roy K. Ferguson, president of St. Regis. The Skenandoa shares had been acquired by the St. Regis in 1944. The viscose process is utilized at the Skenandoa plant.

I. Rogosin, new president of Skenandoa and president of Beaunit, has stated that the output of rayon yarn (about 10,000,000 pounds per year) will be used by the knitting and weaving mills of Beaunit and its subsidiaries.

This acquisition represents the first large scale vertical integration in the rayon industry originated by a consuming mill. Several of the rayon producing companies have set up mills for knitting and weaving rayon in the past, although it is believed that no major extension of this activity is under way at the present time.

CPA to Take Over WPB Functions

The Civilian Production Administration has been organized, by direction of President Truman, to take over the remaining functions, powers, duties and personnel of the War Production Board, according to J. D. Small, newly appointed Administrator of CPA.

The new administrator of CPA has announced that among those who would assist him on transition problems would be: U. S. Member of the Combined Boards William L. Batt, Chairman of Smaller War Plants Maury Maverick, Deputy Administrator Philip Maguire, General Counsel Laurence M. Lombard, Office of Labor Requirements Ralph Hetzel, Review and Analysis Division Robert Johnson, Director of Information Maxey Morrison, and the Directors of the five operating bureaus.

Enco Chemical Elects F. A. Neuberg President

Frederick A. Neuberg, associated with Westvaco Chlorine Products Corporation for over 25 years, resigned in October to join the Enco Chemical Corp., New York, as president. Mr. Neuberg is the youngest son of William Neuberg, Sr., deceased, who founded the Enco business more than 30 years ago.

U. S. Fines Wood Alcohol Anti-Trust Law Breakers

Fines totaling $58,000 have been imposed by Federal Judge J. Waties Waring on eight corporations, one trade association and 14 individuals after they pleaded no contest to indictments charging viola-

tion of anti-trust laws in the production and sale of wood alcohol.

Irving B. Glickfeld, special assistant to the attorney general, said the group controlled 95 per cent of the industry.

The defendants fined were among an Eastern group of 21 corporations, a trade association and 32 individuals charged by the Government with having conspired "to regulate the production and sale of wood alcohol, with the result that prices were fixed at high non-competitive levels, competition eliminated and production curtailed."

Originally all the defendants pleaded innocent to the indictments April 5, 1944. To date, including those who pleaded, all but 13 corporations and 16 individuals have changed their pleas to no contest.

Compton Sees Heating By Atomic Power

Arthur H. Compton, speaking before the Chicago Assn. of Commerce, mentioned the possibilities of future industrial application of atomic power. He stated, "We have not yet built an atomic power plant that is generating electrical power. . . . Beyond the heat exchanger of such a plant, everything would be standard practice. Up to the heat exchanger, all the design requires new features. Uranium blocks can readily be maintained at any desired temperature regardless of how rapidly the heat is being removed. This means a relatively small size heater unit will be needed, and corrosion due to excessive heating is controllable.

"Within ten years it is not unlikely that power companies designing new plants for city service will consider the use of uranium instead of coal for purely economic reasons. If one looks to a billion-dollar-a-year national industry based on atomic power, the nation can afford a considerable investment in research and development."

Hercules Maps Expansion Program

Details of a $30,000,000 postwar construction program covering all the chemical manufacturing departments of the company has been released by Hercules Powder Company. Construction of the new plants and increased facilities will be completed within the next three years. With these additions, Hercules employment in its own plants and offices will continue at the levels reached at the war's end, which was 74% above the prewar figure.

The largest of the company's expansion plans will be put into effect by the cellulose products department, resulting in a material increase in the production of various cellulose derivatives used by the lacquer, plastics, rayon, and other industries. Cellulose acetate capacity will be increased 100% to meet the demands of the plastics and rayon industries, and ethyl cellulose capacity is being increased 100% for plastics and protective coatings.

Included in the cellulose products expansions is the purchase of facilities at Parlin, New Jersey, from the Defense Plants Corporation. This plant will be converted by the installation of new equipment to the manufacture of cellulose acetate and perhaps other cellulose derivatives. Also announced are plans for increasing production of soluble nitrocellulose 1,000,000 pounds monthly at the company's Parlin, New Jersey, plant. This expansion will be accomplished through the use of equipment used in military production at the Parlin plant, with the addition of new dehydration and distillation apparatus, according to E. G. Crum, superintendent of the plant.

The increased ethyl cellulose capacity, which includes also a unit for the production of ethyl chloride, has already been put into operation.

An expansion of 20% in the company's naval stores production facilities will be effected by the construction of an addition to the Brunswick, Ga., plant. The new facilities will be completed, the company expects, by April 1, 1946.

The synthetics department plans an increase in its productive capacity for the manufacture of rosin esters, hydrogenated rosin esters, hydroabietyl alcohol, and other resins. In addition to this added capacity, the department is planning to construct a $1,500,000 organic chemicals and resin plant near Burlington, N. J.

The new plant will be built on a tract of land just north of the city in Burlington township and fronting along the Delaware River. The plant, which will be the sixth synthetics department plant to be placed in operation, will be under the direction of R. F. Schlaanstine, director of operations for the department.

Additions and improvements to the company's seven dynamite and blasting cap plants, the paper makers chemical plants, the naval stores plant at Hattiesburg, Miss., and the purified chemical cotton plant at Hopewell, Va., also are expected to be made within the next year.

Monsanto Makes Postwar Plans

Monsanto Chemical Company has announced that it has listed 151 construction and expansion projects involving an estimated 151 construction and expansion projects involving an estimated $48,400,000 for consideration as a part of its postwar program.

Francis J. Curtis, vice-president in charge of long range planning, reported that aside from proposed construction and expansion expenditures of $48,400,000, additional working capital will be required. He indicated the bulk of proposed capital investments would be made at existing domestic plant locations. Monsanto now has plants, with physical assets valued at about $68,000,000 in 16 cities.

Mr. Curtis said some of the projects contemplate new or expanded facilities for chemicals now being produced, others look toward production of entirely new chemicals.

CALENDAR *of* EVENTS

AMERICAN CERAMIC SOCIETY will hold its 48th annual meeting at the Hotel Statler, Buffalo, April 28—May 1.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS will hold the annual meeting at the Stevens Hotel, Chicago, December 16-19.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS will celebrate its 75th anniversary at the Waldorf-Astoria, New York, September 16-18, 1946.

AMERICAN PETROLEUM INSTITUTE will hold the 25th annual convention at the Stevens Hotel, Chicago, November 12-15.

ELECTROCHEMICAL SOCIETY will hold a national convention in Birmingham, Ala., April 11, 12 and 13.

PACKAGING INSTITUTE, INC., will hold the seventh annual meeting at the Hotel Commodore, New York, November 26 and 27.

NATIONAL FARM CHEMURGIC COUNCIL, INC., will hold its deferred 11th annual meeting at the Statler Hotel, St. Louis, Mo., March 18-20, 1946.

NATIONAL FERTILIZER ASSOCIATION will hold the fall meeting at the Biltmore Hotel, Atlanta, Ga., November 13 and 14.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY will hold the national meeting at the Hotel Commodore, New York, during the week of February 24, 1946.

20TH EXPOSITION OF CHEMICAL INDUSTRIES will be held at Grand Central Palace, New York, February 25 through March 2.

Four ODT Advisory Committees Dissolved

Dissolution of four special wartime advisory committees, composed of executives in the transportation, petroleum, packing house and chemical fields, was announced recently by the Office of Defense Transportation. At the same time ODT dissolved an interagency committee.

Col. J. Monroe Johnson, ODT director, in a letter to members of the Tank Car Advisory Committee, the Tank Car Maintenance Committee, the Chemical Transportation Advisory Committee and the Vegetable Oil and Packing House Tank Car Advisory Committee, thanked the members for their advice and untiring service. He also commended representatives of federal agencies who made up the Special Petroleum and Other Liquids Interagency Transportation Committee.

War controls over the transportation of petroleum and other liquids were cancelled with the revocation of General Order ODT 7 Revised and its amendments as of August 17.

WPB Reviews Past Four Years

To meet vital wartime needs for munitions, medicinals, insecticides and other highly essential military and civilian items requiring chemicals, the Chemicals Bureau of the War Production Board directed the allocation of approximately 10 billion dollars worth of chemicals during the past four years, WPB has reported.

Production of chemicals and allied products in the three year period ranging from 1942 through 1944 was approximately 21.7

billion dollars, WPB pointed out. It is estimated that the value of these products was close to 8.3 billion dollars in 1944, compared with approximately 3.7 billion in 1939. Calculating this increase with the price differential involved, the figures show an increase of approximately 90 per cent in the production of chemicals and allied products in the period 1939 through 1944.

Approximately 4 billion dollars worth of federal and private funds were expended during the past four years for chemical plant expansions, WPB said. In the same period approximately 200 million dollars' worth of chemicals per month was shipped from producer to consumer. The record-breaking quarter for allocation shipments was the first quarter of 1945, when over 1 billion dollars' worth of chemicals was allocated.

The following list of chemicals and allied products with the production calculated in dollar value for 1939 and 1944 shows the increased output during the war years.

Justice Department Ends Merck Anti-Trust Suit

Announcement has been made by the Justice department of the termination of a civil anti-trust suit against Merck & Co., Inc., pharmaceutical chemical manufacturers.

Attorney General Tom C. Clark said a consent judgment ending the suit was entered in the U. S. District Court at Trenton, N. J. The alien property custodian, who had joined as a plaintiff in the suit, consented to the action.

The complaint asserted that Merck & Co. and E. Merck Chemical Works of Darmstadt, Germany, maintained a cartel agreement, dated November 17, 1932, described by the parties as a "treaty," which covered about 400 pharmaceuticals and chemicals, including quinines, sulfa drugs, vitamins, narcotics and mercurials.

Under the judgment the agreement is dissolved and Merck & Co., Inc., is required to license any applicant under 60 patents on a royalty-free and unrestricted basis, and to surrender to the alien property custodian its rights to 50 patents formerly owned by the German concern.

Merck officials stated that for the company, the principal effects of the consent judgment . . . is to terminate a contract which was made in 1932 and which is now obsolete. There never was a 'cartel' arrangement or any action contrary to the American public interests. The Government charges with respect to these matters were categorically denied by Merck & Co., Inc., and the judgment was entered without the court passing upon them."

INCREASE IN CHEMICAL OUTPUT DURING THE WAR

Products	*1939*	*1944*	*Items Included*
	(Millions of dollars)		
Acetates	22.9	56.1	Butyl, ethyl, lead, sodium, etc.
Acids	82.3	194.3	Acetic acid and anhydride, boric, hydrochloric, hydrofluoric, nitric, phosphoric, sulfuric, tartaric, etc.
Bicarbonates and carbonates	42.3	82.0	Sodium, calcium, magnesium, etc.
Hydroxides	37.6	59.0	Sodium, potassium, etc.
Oxides	10.1	17.0	Antimony, magnesium, chromium, mercury, tin, etc.
Peroxides	4.4	6.3	Hydrogen, etc.
Phosphates	20.1	29.0	All sodium and calcium, others
Sodium Silicates	9.2	15.2	Liquid, solid, (meta, ortho sesqui)
Stearates	1.4	3.7	Aluminum, zinc, etc.
Sulfates	22.9	41.0	Aluminum, copper, magnesium, sodium, etc.
Sulfides	2.3	2.9	Sodium, etc.
Sulfites	5.2	16.8	Sodium Hydro, zinc hydro, etc.
Coal-tar products, crude and intermediate	73.4	358.0	Benzene, toluene, naphthalene creosote, pyridine, cresylic acid, aniline, phenol, chlorobenzenes, nitrobenzenes, etc.
Coal tar products, finished	105.5	242.0	Dyes, flavorings and perfumes, rubber chemicals, etc.
Blacks (bone, carbon, lamp)	14.9	32.0	Carbon (furnace and channel)
Bluing	1.1	1.6	Laundry blue, etc.
Cleaning and polishing preparations	76.8	84.0	Automobile polishes and blackings, as well as cleaning compounds
Compressed and liquified gases	58.4	222.0	Oxygen, acetylene, carbon dioxide (gas and solid), hydrogen, etc.
Cosmetics	212.5	408.0	Perfumes, cosmetics, and toilet preparations
Drugs, pharmaceuticals, and medicinals	492.7	1,025.0	Alkaloids, biologicals, essential oils, etc.
Explosives, industrial	63.7	150.0	Dynamite, nitroglycerine, blasting powder, gunpowder, etc.
Fertilizers	161.9	300.0	Mixed fertilizers, superphosphates, etc.
Glue and gelatin	34.4	83.0	Hide bone and vegetable glues, edible and inedible gelatin
Gum naval stores	17.4	22.0	Rosin, turpentine
Wood naval stores	13.4	33.0	Rosin, turpentine
Insecticides	45.7	72.5	Arsenicals, rotenone, pyrethrum, household germicides and fungicides.
Lime	30.0	52.5	Quicklime and hydrated lime.
Matches	25.6	29.0	
Mucilage, paste and other adhesives	8.2	42	Mucilage, paste, mending cement, sealing wax, and other adhesives, except glue and rubber cement.
Paints, varnishes and lacquers	418.4	700.0	Paints, varnishes, lacquers, enamels, drying oils, fillers, putty, shellac, etc.
Phosphate rock	12.3	20.0	
Pigments and colors	113.1	155.0	Lead oxides, lithopone, zinc and titanium pigments, etc. Does not include carbon black, bone black, and lamp black.
Plastics and synthetic resins	78.0	332.0	Nitrocellulose, cellulose acetate, coal-tar resins (in sheets, rods, tubes, and molding powder), vinyl resins, methacrylates, non-coal-tar resins.
Plastic products, fabricated	71.9	306.0	Laminated and molded products
Potash	12.0	29.0	Refined and run-of-the-mine potassium chloride and sulfate.
Printing inks	44.3	50.0	Not including writing ink.
Rayon and allied products	246.0	488.0	Rayon, cellophane, nylon.
Salt (evaporated and rock)	23.0	43.0	
Soap and glycerine	291.9	495.0	Including glycerol refining.

Keane to Direct Hercules Explosives Sales

LeRoy Keane has been appointed director of sales of the explosives department, Hercules Powder Company. He succeeds C. C. Gerow, who has been director of sales since 1919. Mr. Keane, who has been with the company since 1918, was appointed assistant manager of the Pittsburgh, Pa., office of the explosives department in 1932. In 1936, he became manager of the Pittsburgh office.

20th Chemical Show Planned for New York

The Exposition of Chemical Industries will be held in New York, February 25 through March 2, 1946. Inquiries may be addressed to the Exposition of Chemical Industries, Room 701, Grand Central Palace, New York 17, telephone, Wi-2-8234.

Butler Proposes Fertilizer Legislation

Senator Butler, of Nebraska, has introduced Resolution 176, which proposes to request the Secretary of Agriculture to make an immediate study to determine the advisability of continuing the operation of all federally owned plants and facilities which were used during the war for the exclusive processing of agricultural commodities and forest products or

THE BECKMAN IR2 SPECTROPHOTOMETER

BECKMAN INFRARED SPECTROPHOTOMETRIC equipment is widely recognized for its important contributions to the success of the war-urgent butadiene and aviation gasoline programs. This equipment, developed by Beckman engineers working in close cooperation with leading petroleum scientists, made possible for the first time the accurate and rapid process control so essential to full refining efficiency.

It is a significant fact that there have been more Beckman Infrared Spectrophotometers built than all other makes combined. And so successful was the original Beckman Infrared instrument that its far-reaching advancements have now been incorporated into a new and even more versatile instrument, extending the advantages of infrared analytical and control methods to much broader fields of application. This new instrument is the Beckman IR2. Into its design Beckman engineers have embodied the ideas, user-suggestions and first-hand experience gained from the pioneer work in butadiene and 100-octane applications.

There is no other instrument like the IR2, because no other instrument has such a background of valuable experience behind it. It incorporates sweeping advancements in design and construction for maximum versatility, accuracy, speed and convenience. Check over the many unique features. Note how important these improvements are. Make a point by point comparison with conventional equipment and see how much more the Beckman IR2 provides.

Our technical staff will gladly supply more complete details on the Beckman IR2 instrument. A letter, wire or phone call will place this information in your hands without delay. *Beckman Instruments, National Technical Laboratories, South Pasadena 11, California.*

A FEW IR2 ADVANCEMENTS

HERMETICALLY SEALED
No costly air-conditioning required. Unaffected by humidity or atmospheric contamination.

INTEGRAL AMPLIFIER
No extra amplifier needed for recording. IR2 can be direct-connected to standard recorder.

DIRECT-READING SCALES
Wavelength scale reads directly without curves, charts or computations. Per cent Transmission scale also reads directly.

CONSTANT RADIATION
Photoelectronic regulator maintains radiation constant within 0.1%.

ZERO DRIFT ELIMINATED
Greater accuracy; simpler, faster operation.

FALSE ENERGY ELIMINATED
Negligible stray light effects assure increased accuracy.

GALVANOMETERS ELIMINATED
Beam-modulation, bolometer and electronic amplifier eliminate vibration, temperature and non-linearity difficulties associated with galvanometers.

TEMPERATURE CORRECTIONS ELIMINATED
Entire instrument thermostated.

UNUSUAL VERSATILITY
Light sources, cell holders and other elements are interchangeable for a wide range of applications on gases, liquids and solids.

The above are only a few of many IR2 innovations. Write for full details.

BECKMAN INSTRUMENTS CONTROL MODERN INDUSTRIES

for manufacturing nitrates for fertilizer and to report to the Congress his findings and recommendations based thereon. All Federal agencies having jurisdiction over these plants are requested to refrain from selling, leasing, or otherwise disposing of them without the approval of the Secretary of Agriculture until the Secretary has made his report to Congress.

Heath Heads Wyandotte Industrial Sales Department

Roy E. Heath now heads the industrial sales department of the J. B. Ford Division of Wyandotte Chemicals Corporation. Dr. Heath, who assumed his new duties November 1, will be associated with W. M. Cole, former head of the department, who is retaining his connections with the company. Late in 1943, Dr. Heath was granted a leave of absence to join the Metallurgical Laboratory of the University of Chicago to do fundamental chemical research on one phase of the Atomic Bomb Project.

COMPANIES

Jefferson Will Build At Port Neches

Jefferson Chemical Company will erect a large chemical plant on part of a tract of 1,091 acres of land east of and adjacent to The Texas Company's asphalt and roofing plant at Port Neches, Texas, it has been announced by H. L. Derby, president of Jefferson. Products to be made in the new plant will include intermediate chemicals for the manufacture of synthetic rubber, plastics, textiles, and other materials from petroleum and petroleum gases. Jefferson Chemical is jointly owned by American Cyanamid Company and The Texas Company.

At the same time it was announced that American Cyanamid Company is consummating the purchase of about 900 acres immediately east of the Jefferson site, with 2,500 feet fronting on the Neches River, and will erect a chemical plant utilizing some of the products manufactured by Jefferson. Land and foundation surveys have been completed on the Jefferson and Cyanamid tracts.

"The Port Neches site was selected," said Mr. Derby, "primarily because of its proximity to The Texas Company's Port Arthur refinery, which will supply raw materials to the plant in the form of refinery gases.

Lilly Builds Streptomycin Plant

Eli Lilly & Co. is building a plant for the production of streptomycin. Capacity of the plant has not been disclosed. The company has been producing streptomycin in small quantities in a pilot plant, and turning its total output over to the Government.

It was learned, however, that some small part of the present streptomycin production may soon be available for civilian use. The distribution, it was said, would follow the pattern established for allocation of penicillin before it was released for unrestricted use.

Corning Increases Latin Interests

The third important development since 1943 in Corning Glass Works' expansion program in South America has been completed with the purchase of a substantial interest in Cristalerias de Chile, largest glass manufacturer in that country.

Details of Corning's new acquisition were made public by William H. Curtiss, vice-president and secretary of the company, who emphasized that the majority control of the Chilean concern would be retained by the original owners in South America, while Corning would be represented on the board of directors.

Merck to Make Streptomycin

Merck & Co., Inc., Rahway, N. J., has announced that construction of large manufacturing facilities is being started for the production of streptomycin. WPB approval of priorities for plant and equipment materials was received on August 1, company officials said. The new plant is expected to go into production early in 1946.

A production unit consisting of three buildings, including several large fermenters, will be constructed at the company's Stonewall Plant at Elkton, Va. A unit for drying and packaging the drug will be constructed at the company's main plant at Rahway, N. J. Total cost will approximate $3,500,000.

Mathieson Builds at Niagara Falls

A new plant which will double the output of sodium chlorite is now being added to the Niagara Falls, New York, production facilities of The Mathieson Alkali Works, according to George W. Dolan, president of the company. Construction cost of the new building is estimated at $35,000 and its total cost at about $323,000.

Du Pont to Erect Wilmington Office Building

Plans for a new 18-story office building to be erected at Tenth and Tatnall Streets in Wilmington, Del., as an addition to the Nemours Building were recently disclosed by E. I. du Pont de Nemours and Company.

Construction is to start next Spring, and the new structure will be completed by the Spring of 1947. A preliminary estimate of the cost is approximately $3,000,000.

Kemler Heads Southern Institute Engineering

E. N. Kemler has been appointed head of the newly created engineering research division of the Southern Research Institute, Birmingham, Alabama. Dr. Kemler comes to the Institute from Purdue University where he was professor of Mechanical Engineering.

Apex Buys K & S Chemical

Stanford L. Hermann, operating vice-president of the Apex Chemical Co., Inc., Elizabeth, N. J., has announced the purchase of all installations, equipment, and laboratories of the K & S Chemical Company, formerly of 44 Cliff Street, New York City, manufacturer of fine chemicals and drugs.

Company Notes

HEWITT RUBBER CORPORATION has announced that the P. J. O'Donnell Company, Inc., has been appointed Boston distributor and will handle sales of industrial rubber products throughout Eastern Massachusetts.

GODFREY L. CABOT, INC., has named Raw Materials Co., 77 Franklin St., Boston, Mass, as agent for carbon blacks and pine tars. The company has been organized by C. W. Bloom, previously general sales manager for Cabot.

Educational Notes

William A. Mosher, technical assistant to the director of research, Hercules Powder Company, has resigned from the company to accept the position of head

of the chemistry department at the UNIVERSITY OF DELAWARE. He assumed his duties at the university November 1. Dr. Mosher joined Hercules in July, 1940.

UNIVERSITY OF CHATTANOOGA, Chattanooga, Tenn., has established an Industrial Research Institute to provide research for industry, fundamental scientific studies, training for scientists and the maintenance of a science library. The Institute will be housed in a new building on the University campus, 614 Baldwin St.

A gift of $15,000 from the Harshaw Chemical Co. of Cleveland to WESTERN RESERVE UNIVERSITY for the furtherance of research in inorganic chemistry was recently announced by President Winfred G. Leutner of the university. President Leutner said the fund will support two fellowships in a three-year program of research under the direction of Harold S. Booth, professor of chemistry.

THE UNIVERSITY OF CHICAGO has established an institute for applying the results of nuclear physics research to such problems as cancer, heredity, and the aging process, Chancellor Robert M. Hutchins has announced. The institute, to be known as the Institute of Radiobiology and Biophysics, will be headed by Professor Raymond E. Zirklo.

NEWS *of* SUPPLIERS

Citation of THE RUST ENGINEERING CO., Pittsburgh, Pa., for a safety record surpassing any previously set under the U. S. Engineer Department in the hazardous job of reactivating TNT plants, has been issued by the St. Louis, Mo., District Engineer Office.

THE UNITED TUBE CORPORATION OF OHIO, manufacturer of welded mechanical tubing, has announced the opening of a new plant at 2134 West 53rd Street in Cleveland.

To render better service to the mines and industrial plants in the West Virginian territory, ROBINS CONVEYORS INC. and its affiliate, HEWITT RUBBER CORP., have opened a new office in the United Carbon Building in Charleston, W. Va. R. U. Jackson, who has represented Robins Conveyors in the territory for 15 years, will be in charge of the office, assisted by H. N. Kepler, sales engineer.

CONTINENTAL CAN COMPANY has acquired the stock of the Gould Paper Company of Lyons Falls, New York, manufacturers of ground wood specialties.

Cain Is Assistant Penn Salt Sales Manager

R. L. "Mike" Cain has been made assistant sales manager of the Pennsylvania Salt Manufacturing Company, Philadelphia, Pennsylvania. Mr. Cain was formerly with Westvaco Chlorine Products Company. In August, 1942, he joined Pennsylvania Salt as assistant to the director of sales.

G. E. Seavoy, vice president and manager of SWENSON EVAPORATOR COMPANY, division of Whiting Corporation, Harvey, Illinois, has made known the appointment of James R. Lientz to the position of consulting chemical engineer in charge of all sales to the pulp and paper industry. His headquarters will be in Harvey, Illinois.

Harry G. Howell is the new vice-president of TUBE TURNS, INC., Louisville, Ky., in charge of production. He spent four years as head of Oldsmobile's plant and a total of twenty-two years' association with General Motors.

OLIVER UNITED FILTERS, INC., has announced that Gordon M. Girdwood has been transferred from the central division of sales in Chicago to Oakland general offices to fill the newly created position of Engineering Field Representative. He will act as liaison between engineering and sales.

Nelson Todd has rejoined the HANSON-VAN WINKLE-MUNNING CO., Matawan, New Jersey, as assistant to the president. He has been re-elected a director in the company. Charles W. Yerger, for a number of years vice-president in charge of sales for the the company, has retired.

The appointments of W. E. Dueringer as assistant sales manager and H. E. Weaver as proposition department manager have been announced by H. M. Hammond, general sales manager of BAILEY METER COMPANY, Cleveland, Ohio.

John E. Slaughter, Jr., vice-president of THE GIRDLER CORPORATION, Louisville, Ky., in charge of the firm's Votator Division, has made known the promotion of Harold G. Houlton to manager of Votator's Technical Service.

R. P. CAMPBELL, Chicago sales and service representative office of Wheelco Instruments

Co., has been appointed district manager for the territory comprising Missouri and Southern Illinois. Mr. Campbell's office will be 3909 Olive Street, St. Louis, Missouri.

THE UNITED STATES STONEWARE COMPANY, Akron, Ohio, has announced the acquisition of the plant, processes, equipment and personnel of Plastispray Corporation, 927 North Sycamore St., Hollywood, California. The new division of U. S. Stoneware will operate under the name of Western Process Equipment Co. J. A. Maher has been named vice-president and general manager of the new division.

Harry A. Winne, vice-president in charge of engineering for the GENERAL ELECTRIC COMPANY'S apparatus department, has been appointed vice-president in charge of engineering policy for the entire company. Ernest E. Johnson, assistant engineer of the aeronautics and marine engineering division, has been named to succeed Mr. Winne.

CUTLER-HAMMER, INC., electrical manufacturer, of Milwaukee, Wisconsin, has announced the appointment of F. A. Wright as assistant general sales manager. Mr. Wright has been associated with the company since 1927. He was a member of the St. Louis district sales office until 1939 when he was appointed manager of Resale Sales and joined the Milwaukee Headquarters.

Two promotions in the personnel of the RELIANCE ELECTRIC & ENGINEERING COMPANY, have been made known by James W. Corey, president. Fred E. Harrell, chief engineer for the past two years, has been appointed general works manager, succeeding S. B. Taylor, who has resigned as manufacturing vice president but will remain a member of the Board of Directors. William R. Hough, product development engineer, has been named chief engineer succeeding Mr. Harrell.

CERTIFIED ALLOY VALVE COMPANY has been formed as a new division of THE COOPER ALLOY FOUNDRY Co., Hillside, N. J. The new company will specialize in the manufacture of stainless steel valves for which it will furnish a certified analysis of every part which comes in contact with liquid. P. C. Shaffer is chief engineer. Products will be sold through Cooper.

Morton I. Dorfan has been appointed manager of the dust and fume engineering division of AMERICAN FOUNDRY EQUIPMENT Co., Mishawaka, Indiana. In this position he will supervise and coordinate the company's expanded dust control sales, engineering and research activities. His previous activities in this field have been associated with Allis-Chalmers Mfg. Co., Blaw-Knox Co., and Pangborn Corp. Since 1941 he has been engaged in private consulting engineering.

Robert R. Miller has been promoted to sales manager, industrial trades, and W. J. Streicher to sales manager, distributor trades, in the Cincinnati territory, it has been announced by George H. Halpin, MINNESOTA MINING & MANUFACTURING COMPANY vice president and general sales manager.

Edward J. Burnell, vice-president, LINK-BELT COMPANY, Chicago, has announced the appointment of A. C. Fellinger to the position of sales manager, power transmission machinery, with headquarters at the company's Ewart plant in Indianapolis.

The board of directors of AMERICAN CAR AND FOUNDRY EXPORT Co. recently elected R. A. Williams as executive vice-president and as a director. Mr. Williams will be in direct supervision of sales, subsidiary companies, and foreign representatives.

The INDUSTRIAL OVEN ENGINEERING COMPANY of Cleveland has opened a branch office in Chicago, located at 332 South Michigan Avenue. In charge of the Chicago office are H. W. Munday and F. T. Greaves, both engineers and specialists in industrial heating problems. Mr. Munday is a director of the Armour Research Foundation and a trustee of the Illinois Institute of Technology.

Announcement of the appointment of Arthur M. Stewart, Jr. as advertising and sales development manager, effective September 15, has been made by William H. Jones, vice-president of THE RAILWAY SUPPLY & MANUFACTURING Co.

THE FOXBORO COMPANY, Foxboro, Mass., maker of industrial instruments for measure-

ment and control, has announced that Clarence Leslie Williams has joined its staff of sales engineers whose headquarters are in the company's New York office, 420 Lexington Ave. He has been assigned to the northern New Jersey territory and has already entered upon his new duties.

A $5,000,000 postwar research and production expansion program has been approved by the board of directors of the ALLEGHENY LUDLUM STEEL CORPORATION, president Hiland G. Batcheller has stated. A research laboratory and related experimental and pilot plant equipment will be built at company headquarters, Brackenridge, Pa., to intensify studies of the structure, melting, processing and further development of high alloy steels. At the West Leechburg, Pa. plant will be constructed a cold rolling mill of latest design, for rolling stainless and silicon strip steels.

James S. Wilson has been advanced by THE WATSON-STILLMAN COMPANY, Roselle, New Jersey, to manager of plastics equipment sales. Mr. Wilson formerly headed the plastics molding laboratory, and before that was with the plastics division of General Electric Company.

KENNAMETAL INC., of Latrobe, Pa., has appointed W. D. Turnbull as general sales manager. The company plans to increase its present activity in the metal-working industry, and also to extend its application to other fields, such as mining, petroleum, and wood-working. He was previously with Westinghouse Electric Corp. For four years he was Vice President in Charge of Sales for Pomona Pump Co., of Pomona, California.

ASSOCIATIONS

Packaging Institute Meets

The seventh annual meeting of Packaging Institute, Inc., will be held at the Hotel Commodore, New York, on November 26 and 27. Attendance at this meeting and packaging conference will be limited to members of the Institute.

Announcement was made of the appointment of Major Albin P. Dearing as Executive Director of the Institute. Major Dearing assumed his new position on November 1.

NAIDM Will Meet in New York, December 3

The 32nd annual meeting of the National Association of Insecticide and Disinfectant Manufacturers, Inc., will be held December 3 and 4 at the Hotel Commodore, New York.

Controllers Institute Elects Sheehan

Daniel M. Sheehan, comptroller of the Monsanto Chemical Company, St. Louis, was reelected a vice-president of the Controllers Institute of America at that group's annual meeting, held Monday, September 24, in the Stevens Hotel, Chicago.

Mr. Sheehan was president of the St. Louis Control of the Institute for the year 1943-44.

Consulting Chemists Meet

At the annual meeting of the Association of Consulting Chemists & Chemical Engineers, Inc., held October 23, 1945, at the Architects' Club Dining Room, New York, the newly elected officers and councilors of the association were announced.

They are: president, Albert Parsons Sachs, consulting chemical engineer, New York; vice-president, Henry M. Shields, Bull & Roberts, New York; secretary, Claude F. Davis, chief chemist, Schwarz Labs., Inc., New York; and treasurer, Sam Tour, Sam Tour & Co., Inc., New York. Councilors will be: Percy E. Landolt, chemical engineer, New York; Roger W. Truesdail, president Truesdail Labs., Inc., Los Angeles, Calif.; and John M. Weiss, John M. Weiss & Co., New York.

Corrosion Engineers Plan Kansas Meeting

The National Association of Corrosion Engineers has announced the dates of May 7, 8 and 9 for its 1946 annual meeting and convention, which will be held in Kansas City, Missouri, with headquarters in the President Hotel.

A. I. Ch. E. to Appoint Local Section Liaisons with C. E. D.

The American Institute of Chemical Engineers, along with other national engineering societies, is appointing representatives of its various local sections to work with area committees of the Committee for Economic Development to help promote privately financed industrial construction. C. E. D. studies show that a quota of $10,000,000,000 total private construction annually will be necessary to maintain postwar high-level employment.

Foster Elected Northeastern A. C. S. Chairman

Stuart Brooks Foster, head of the department of chemistry in the State Teachers College at Framingham, Mass., has been elected chairman of the Northeastern Section of the American Chemical Society. He succeeds Prof. Harold A. Iddles of the University of New Hampshire.

Gas Association Elects Director

H. Carl Wolf, president of the Atlanta Gas Light Company, Atlanta, Ga., has been elected managing director of the American Gas Association, effective October 1. Mr. Wolf now succeeds Alexander Forward, who has held the post since 1923 and is now retiring from active business.

PERSONNEL

Wellman to Join Calco

The Calco Chemical Division, American Cyanamid Company, Bound Brook, New Jersey, has announced that Victor E. Wellman will join the staff of its development department, on January 1, 1946. In addition to his development work, Dr. Wellman will serve as technical advisor to the sales department on matters relating

to intermediates and chemicals. He is presently connected with R. W. Greeff & Company, Inc., New York, and was for 15 years with the B. F. Goodrich Company, Akron, Ohio.

Midwest Institute Increases Staff

The Midwest Research Institute, Kansas City, announces the addition of the following eight new members to its technical staff, which brings the total personnel of the Institute to seventy-one: Robert R. Hancox, physicist, formerly on the staff of the Armour Research Foundation, Chicago, and more recently with the Western Electric Company, Chicago; Robert W. Shortridge, formerly with the Monsanto Chemical Company, Dayton, Ohio; Lorenzo D. Moore, formerly of the Koppers Company, Inc., Kearny, New Jersey; John Affleck; Jerome Brewer, from the staff of the University of Chicago; Carl R. Johnson, who recently was discharged from the Navy; George W. Swehla; and Louise T. Alderman.

Prather Joins Standard Oil

R. M. Prather, of the Westvaco Chlorine Products Corporation, has joined the recently organized chemical products department of the Standard Oil Company (Indiana) to be in charge of market-research activities. Mr. Prather has spent most of his business career in the paint and alkali industries. For the last several years he has been in charge of market research for Westvaco.

Rosner Heads Nopco Laboratories Sections

Lawrence Rosner, formerly chief chemist for the Laboratory of Vitamin Technology in Chicago, now will be in full charge of the chemical, physical, and microbiological assay sections of the Nopco Vitamin Laboratories in Harrison, N. J., according to a statement just released by Perc S. Brown, National Oil Products Co. vice-president. A Penn State graduate in 1935, Dr. Rosner obtained his Ph. D. in 1937 from Northwestern. Since then, Dr. Rosner has spent five years on problems of vitamin assay and technology.

Davison Names Dunkak

Chester F. Hockley, president of The Davison Chemical Corporation, Baltimore, Md., has announced the formation a new engineering division which will be headed by E. B. Dunkak, as manager.

Mr. Dunkak's assistants are: J. C. Albright, head of the consulting engineering section, whose activities will consist of supplying consulting engineering services; R. S. Van Note, head of the equipment section, whose responsibilities will be to supply industrial process and related equipment; and Kenneth H. Van Valkenburg, head of the process engineering section. Mr. Van Valkenburg was recently affiliated with the Vellex Corporation.

Goodrich Chemical Appoints Treasurer

Harry E. Foster has been appointed treasurer of B. F. Goodrich Chemical Company of Cleveland, W. S. Richardson, president, has announced. Mr. Foster, who was formerly general auditor, also becomes assistant secretary of the company.

DuPont Names Burrows

Appointment of Lawton A. Burrows, as assistant manager in charge of research, technical division of the explosives department, has been announced by E. I. du Pont de Nemours & Company. He succeeds W. E. Lawson, a former director of Eastern Laboratory, Gibbstown, N. J., who is assigned to special duties. Wesley M. Nagle was appointed assistant director at Eastern Laboratory.

Warner Appoints Sales Managers

R. D. Hetterick, general sales manager of William R. Warner & Co., Inc. has made public the appointments of Romo Farias and L. J. Barrett as divisional sales managers of the New York and St. Louis Divisions, respectively.

Mr. Farias was formerly district manager of the Bronx Division of professional field representatives of William R. Warner & Co., Inc. Mr. Barrett has been with William R. Warner & Co., Inc. for over 4½ years and has served, during that time, as professional field representative in the Chicago territory.

General Aniline Promotes Fuller

D. L. Fuller has been promoted to the position of section leader and will be responsible in part for the work on the development of new products at General Aniline and Film Corp.

J. W. Copenhaver has been promoted to the position of group leader and will work with Dr. Fuller. Working with Dr. Copenhaver will be: R. E. Field, J. Dailey, and R. S. Towne.

W. Converse has been appointed assistant to the director of research.

Resinous Products Increases Sales Staff

The Resinous Products and Chemical Company of Philadelphia has announced the following appointments to their office staff: Gerould T. Allen, formerly Chief of the Synthetic Resin Section of the War Production Board, Bernard J.

Lyons, until recently Chief of the Alkyd Resins Unit of the War Production Board, and Arthur H. Munkenbeck, Jr., who during the War was a Lieutenant in the Artillery of the U. S. Army.

Warner Advances Hastings

L. A. Klein, vice-president and treasurer of William R. Warner & Co., Inc., has announced the promotion of T. P. Hastings to the position of controller of the company.

Mr. Hastings has been with the Company in various capacities during the past twenty-five years. In his new position he will be in complete charge of the recently established division of accounts which has been set up as a part of the reorganization program of William R. Warner & Co., Inc.

Pennsylvania Coal Products Appoints Three

Pennsylvania Coal Products recently announced the appointment of three new men in its Penacolite Division. Royden C. Rinker will be engaged in resin research, R. Bowman Stratton, Jr., in special products sales development, and Bill Swick in adhesives sales. Mr. Rinker was formerly in the Plastics Section of the National Bureau of Standards and prior to that with the Department of Agriculture.

McClellan to Head Du Pont Rayon

G. E. McClellan, manager of the Spruance rayon plant, Richmond, Va., for the last four years, has been appointed director of production of the Rayon Division, it has been announced by E. I. du Pont de Nemours & Company.

He replaces Arlington Kunsman, who has been promoted to assistant manager of the Cellophane Division. A. B. Walmsley, Jr., manufacturing superintendent under Mr. McClellan, becomes manager of the Spruance plant.

Celanese Promotes Two

Celanese Corporation of America has announced that H. C. Van Brederode and J. P. Holmes have been elected vice-presidents of Celanese Company, Inc., a wholly owned subsidiary.

Mr. Van Brederode has been sales manager of the fabric division of Celanese Corporation of America and Mr. Holmes has been in charge of the warp knit division. Mr. Congdon has been supervising the Celanese weaving activities.

Anderson Promoted in Bureau of Mines Division

C. C. Anderson, engineer-in-charge of the Bureau of Mines Exell, Texas, Helium Plant since its opening in March

1939, has been appointed assistant chief of the Petroleum and Natural Gas Division in Washington, D. C.

Personnel Notes

GEORGE L. PARKHURST, formerly with the Standard Oil Co. of Indiana and with the Petroleum Administration for War, has been appointed vice-president and a member of the board of directors of the Oronite Chemical Co.

E. T. POWERS, formerly process chemical engineer in the East St. Louis plant of the Monsanto Chemical Co., has joined the Celanese Corporation of America, for the purpose of coordinating employment of technical personnel.

GEORGE C. RAMEY has been appointed, by the American Cyanamid Co., as advertising manager and director of promotion and publicity of its textile resin department. Mr. Ramey was recently released from active duty as a lieutenant in United States Naval Aviation. He was formerly connected with Clarence Whitman & Sons as sales manager of the Wilkes-Barre Lace Manufacturing Co.

KENNETH SUTHERLAND has joined the staff of Bjorksten Laroatories, 185 N. Wabash Avenue, Chicago, as a chemist. Mr. Sutherland was previously associated with Turco Products, Inc.

WILLIAM H. BOWMAN, formerly manager of the technical service and market development division of Westvaco Chlorine Products Corp., has joined the Jefferson Chemical Co., as director of market development.

The du Pont Company has announced that JOHN M. CLARK, assistant production superintendent of the Chambers Works, Deepwater, N. J., has been appointed to the newly created position of general superintendent of the Photo Products Department with headquarters in Wilmington.

After three years as Major in the Production Division, ASF in Washington, E. K. STEVENS has returned to his position as associate manager of the Exposition of Chemical Industries.

RICHARD E. CHADDOCK has joined the research department of Hercules Powder Company as technical assistant. He will work on process problems. Dr. Chaddock is chairman of the Philadelphia-Wilmington Section, Committee on Junior Activities, American Institute of Chemical Engineers.

JOHN H. MONTGOMERY has been made first vice-president and treasurer of Fritzsche Brothers Inc., succeeding the late W. A. R. Welcke. Mr. Montgomery is also a member of the board.

JAMES G. VAIL, vice-president and director of the Philadelphia Quartz Com-

pany, Philadelphia, recently celebrated 40 years of continuous service with the company. His fellow directors and associates tendered a testimonial luncheon in his honor at the Downtown Club in Philadelphia.

NORMAN R. PETERSON of The Dow Chemical Company, after three years in the United States Army, has returned to take up new duties with the company specializing in development work on coatings derived from styrene and Saran.

J. ALBERT RAYNOLDS, formerly technical director of Vitamin Oil Operations for Atlantic Coast Fisheries Co., has assumed full-time duties as technical consultant for National Oil Products Co., Harrison, N. J., according to an announcement by Perc S. Brown, Nopco vice-president.

HENNY C. SPEEL, formerly with the Atlas Powder Company of Wilmington, Delaware, has joined the research department of General Mills, Inc., it was announced recently by Harry A. Bullis, company president, and Arthur D. Hyde, director of research. With headquarters at the research laboratories in Minneapolis, Mr. Speel will work as development engineer on new chemical products.

The Mathieson Alkali Works has announced that R. J. QUINN, heretofore assistant to the vice-president-director of sales, is leaving the executive offices in New York to undertake an important new sales assignment for the company in its southeastern territory.

ALAN B. BELL, technical director of Evans Chemicals, Ltd., arrived in New York from England recently for an extended visit with Evans Chemetics, Inc., New York. Mr. Bell is here for the exchange of technical ideas, the formation of better liaison, and the extension of export business.

FREDERIC W. JUNG, specialist in chemical and fuel technology, who has been conducting research in gas for the Chilean government, has joined the staff of the Midwest Research Institute. Mr. Jung previously was employed by the City of New York and Pittsburgh in this field and also assistant director of research of the Polytechnic Institute, Brooklyn, in plastics and magnesite flooring.

R. M. SIMPSON has been appointed as sales representative for the Chicago territory of Pittsburgh Plate Glass Company, Columbia Chemical Division. Mr. Simpson will be located in the Chicago Office at 1721 Tribune Tower Building, and will represent the sale of alkalies, liquid chlorine, and related industrial chemicals.

Appointment of S. U. SHOREY as assistant manager, plasticizers and resins sales, and of B. B. LANGTON, as assistant manager, intermediates sales, has been announced by Robinson Ord, general sales manager of Monsanto Chemical Company's Organic Chemicals Division.

WILLIAM M. MURRAY, JR. has joined the staff of Southern Research Institute to take charge of the work in analytical chemistry. He was formerly with General Electric Laboratories at Pittsfield, Mass. J. F. VINCENT, biochemist, formerly head of the Biological Laboratory of Goodyear Tire & Rubber Company, Akron, Ohio, has also become a member of the staff.

Hercules Powder Company announced following the latest board of directors meeting that JOHN J. B. FULENWIDER and J. B. JOHNSON were elected directors of the company. Also made public was the appointment of RICHARD T. YATES, Jr., as assistant director of sales of the company's naval stores department. Prior to this, Mr. Yates was manager of domestic sales of the department.

The Velsicol Corporation, Chicago, has announced the appointment of LLOYD M. JOSHEL as general purchasing agent. Dr. Joshel has been associated with the Chemicals Bureau of The War Production Board from early 1942 until recently.

Correction

M. F. Crass, Jr., author of the article in the October issue describing the new boxed carboy, has pointed out that the phrase, ". . . when operating with lading under temperature conditions as high as 130° Fahrenheit" should have been added to the first paragraph inasmuch as the temperature limitation is a definite part of the ICC specification.

Also, a footnote was omitted, reference to which was indicated by an asterisk following the title. The footnote gave credit to the M. C. A. Glass and Wood Packages Committee whose report was the basis of the article.

We regret that these items were inadvertently omitted in setting the manuscript into type.—EDITORS.

L. B. KEPLINGER has resigned as vice-president and director of the Rheem Manufacturing Company, New York, to assume his duties as president and general manager of the Steel Shipping Container Institute, 570 Lexington Avenue, New York.

ALFRED RATOWE has been transferred from the laboratory to the sales staff of Burkart-Schier Chemical Company of Chattanooga, Tennessee and will act as Eastern representative of the company with headquarters in New York City.

The Dow Chemical Company has announced the addition of JAMES V. WINKLER to their Los Angeles staff as development engineer for magnesium on the West Coast. Mr. Winkler was formerly in charge of experimental engineering at the magnesium fabrication laboratory in Bay City, Michigan.

COMM. GEORGE W. MOYERS, USA(R), recently discharged, has resumed his duties as sales manager of International Minerals & Chemical Corporation's Phosphate Division. With the corporation since 1927 he took a leave of absence to accept his Navy commission in August, 1942. He will make his headquarters at the general offices, 20 N. Wacker Drive, Chicago.

EDWARD HEISER recently became manager of the Cincinnati office of Michigan Alkali Division of Wyandotte Chemicals Corporation. Mr. Heiser succeeds G. T. ROBINSON who has been transferred to Chicago to manage J. B. Ford Division sales in the midwestern area.

The retirement of A. A. SHIMER, as sistant to the director of operations of Hercules Powder Company's Naval

Stores Department, has been announced. Mr. Shimer, who has been an employee of Hercules for 28 years, joined the company in 1917 as assistant chief engineer at the Home Office.

W. S. GILLAM, professor of agricultural chemistry at Purdue University, Lafayette, Ind., has joined the staff of the Midwest Research Institute, Kansas City, where he will specialize in research in soils, plant nutrition and analytical services. He was formerly on the faculty of Michigan State College.

LORAIN SZABO has resigned from the technical staff of Alabama Ordnance Works to become bacteriologist at Southern Research Institute, Birmingham, Ala.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912 AND MARCH 3, 1933

Of *Chemical Industries*, published monthly except twice in November, at Philadelphia 4, Pa., for September 14, 1944.

State of New York, County of New York, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Robert L. Taylor, who, having been duly sworn according to law, deposes and says that he is the Editor and Manager of *Chemical Industries* and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Maclean-Hunter Publishing Corporation, 522 Fifth Avenue, New York 18, N. Y.; Editor, Robert L. Taylor, 522 Fifth Avenue, New York 18, N. Y.; Managing Editor, none; Business Manager, L. Charles Todaro, 522 Fifth Avenue, New York 18, N. Y.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent, or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Maclean-Hunter Publishing Corporation, 522 Fifth Avenue, New York 18, New York. The stockholders of the Maclean-Hunter Publishing Corporation are: John R. Thompson, 2511 Coyle Avenue, Chicago; J. L. Frazier, 2043 Orrington Avenue, Evanston, Illinois; Col. J. M. Maclean, 7 Austin Terrace, Toronto, Ontario; Horace T. Hunter, 120 Inglewood Drive, Toronto, Ontario; Maclean-Hunter Publishing Company, Ltd., 481 University Avenue, Toronto, Ontario.

3. That the known bondholders, mortgagees, and other security holders owning or holding one per cent, or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

ROBERT L. TAYLOR,
Editor and Manager.

Sworn to and subscribed before me this 2nd day of October 1945, Mildred R. Endres, Notary Public, Queens Co. No. 4127, Reg. No. 87-E-5; cert. filed in N. Y. Co. No. 381, Reg. No. 233-E-5.

CHEMICAL SPECIALTIES NEWS

Foundation Set Up for Toilet Goods Research

The Toilet Goods Research Foundation, Inc., has been chartered in the State of New York as a membership corporation without capital stock.

The principal objects of the foundation call for conducting research, experimental and development work with relations to toilet preparations, cosmetics and other substances used externally or internally, for purposes of health, for the amelioration or cure of disease, or for beautification, and more specifically to carry on scientific research for the safeguarding of the public health with a special regard to the effect of cosmetics and toilet preparations by particular users, including the study of allergies, as connected with cosmetics and toilet preparations.

The number of authorized directors is nine, and the directors to serve until the first annual meeting of the corporation are Dr. Marston T. Bogert, John H. McShane, Cecil Smith, Dr. Mark W. Tapley, Dr. Ernest Little, Herman L. Brooks, Northam Warren, Audre Wick, and Charles A. Mooney.

Goldberg Joins Geigy from WPB

Geigy Co., Inc., announces that Melvin Goldberg, formerly a WPB executive, has joined the organization.

For the past four years until October 1, Mr. Goldberg has been chief of the Insecticides and Fungicides Unit of the Chemical Bureau, War Production Board. His activities during the war were particularly related to DDT, pyrethrum, rotenone and the arsenicals.

Prior to his WPB work, Mr. Goldberg conducted research for the United States Bureau of Animal Industry and for the United States Health Service.

Delta Chemical Plans Specialties Factory

The Delta Chemical Co., Baltimore, has revealed plans for the construction of a plant in Chattanooga, Tenn., for the manufacture of laundry, cleaning, and disinfecting supplies.

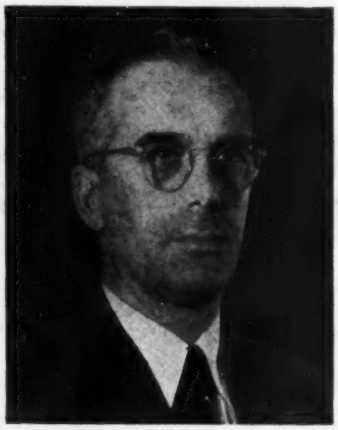
Boynton Leaves WPB; Joins Ashcraft-Wilkinson

R. S. Boynton, chief of the lime and boron chemicals unit of the Chemicals Bureau of the War Production Board, resigned to become associated with Ashcraft-Wilkinson Company, Atlanta, Ga., in its industrial chemicals department. Mr. Boynton had been with WPB for almost two years, having joined the Inorganics Branch of the Chemicals Bureau in November, 1943.

Norwich Subsidiary Headed by Eaton

Melvin C. Eaton has been named president and general manager of the Eaton Laboratories, Inc., a newly incorporated and wholly owned subsidiary of the Norwich Pharmacal Company, Norwich, N. Y. The purpose of the new corporation is to create and to market, through ethical channels only, preparations which constitute advances in therapeutics. Distribution of Eaton products will be through the sales organization of the parent company.

Stearns Promotes Boegly



William J. Boegly has been appointed divisional vice-president in charge of plant operations of the Frederick Stearns & Company Division, Sterling Drug, Inc., Detroit, Michigan. Boegly joined the company July 1, 1943, as factory manager, prior to which he was with John Wyeth & Brothers, Philadelphia.

S. C. Johnson Lists Personnel Changes

During the last three months S. C. Johnson & Son, Inc., Racine, Wis., has made several promotions and additions involving members of the technical and administrative staffs:

Production Division: William S. Dowman, personnel manager, formerly manager of salary personnel, Goodyear Aircraft Corp.; Paul A. Pfleeger, production control manager, formerly assistant production control manager, U. S. Rubber Co., Mishawaka, Ind.

Research and Development Division: A. E. Budner, chief development chemist, formerly development chemist, emulsion products; E. S. McLoud, chief research chemist, formerly development chemist, wax products.

Sales Division: Chester L. Boe, merchandiser, fabrics finishes, formerly western manager, Talon, Inc.; Robert F. Vance, advertising service manager, formerly advertising manager, Wilson Sporting Goods Company, Chicago; Robert H. Van Roo, editor, formerly assistant director of publicity, MacFarland, Aveyard and Co.; Miss Honore O'Brien, consumer education director, formerly home economics director, Fair Store, Chicago.

Olsen Manages Wright Carbon

Alan B. Olsen has left H. M. Storms Co., Brooklyn, N. Y., manufacturers of typewriter ribbons and carbons, where he has been a research chemist for over six years, to become vice-president and general manager of Wright Carbon Co., Cleveland, Ohio.

Mr. Olsen was graduated from Colgate University in 1936 and started in his present field of activity with Remington Rand, Inc. He has been active in the development of improved waxes and colors for carbon papers.

Paint Company Expands Plant

Contract for the construction of a new 100 x 300-ft. addition to the Minnesota Linseed Oil Paint Co.'s Fort Wayne factory was let to the Indiana Engineering and Construction Company.

The new building will be of the monitor type, one story. It will be used to store raw materials and finished stock, thus making available in the present three-story factory building 30,000 sq. ft., which will provide additional space for new manufacturing equipment.

A new laboratory to formulate special finishes, control raw materials and finished products will be constructed on top of the new warehouse.

Bjorksten Expands Lab Facilities

Dr. J. Bjorksten announces that the Bjorksten Laboratories has leased 1,000 square feet of space at 13791 South Avenue "O", Chicago. This space is in addition to the quarters occupied at 185 North Wabash Avenue, where the organization will continue to have its main office.

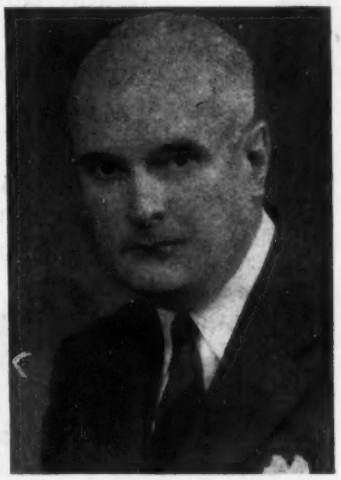
During the past year, Bjorksten Laboratories has been engaged in work on rubber fillers, plastics, new types of anti-corrosives and metal machining chemicals, carbon removers, and organic synthetic compounds for special purposes.

Naylor Joins General Printing Ink

George W. Naylor, recently on the staff of the Production Division, Army Service

Forces, with the rank of Lieutenant Colonel, has entered the employ of General Printing Ink Corporation on October 1, 1945. While in the service Mr. Naylor was the Army Liaison Officer to the Protective Coatings Branch, Chemicals Division, War Production Board, and the Fats and Oils Division, Production and Marketing Administration, Department of Agriculture.

McIntosh Made Haeuser Vice-President



The Haeuser Shellac Company, Inc., announces the appointment of William J. McIntosh as vice-president in charge of laboratory and plant management. Mr. McIntosh for the past thirteen years has been chief chemist of the MacLac Company, Rahway, N. J.

Les Brown Represents Nopco on West Coast

Promotion of "Les" Brown to Pacific Coast sales manager, Vitamin Division, National Oil Products Co., on October 1, 1945, has been announced by Perc S. Brown, vice-president of the firm. Associated with Nopco's Vitamin Division as a sales executive since 1928, "Les" now takes charge of Nopco West Coast sales for the Special Markets Department which sells Nopco vitamin materials to the pharmaceutical and food trades; the Agricultural Department which markets Vitamin A and D feeding oils and fortified cod liver oils to the feed and poultry trade; and the Vitex Department which distributes Vitex Vitamin D Concentrate to the milk industry. "Les" already has established his headquarters at the Richmond, California, office of National Oil Products Co.

Pickard Joins Sales Staff Of Robinson, Wagner

Lieut. Joseph C. Pickard has joined the sales staff of the Robinson, Wagner Co., New York, manufacturers of lanoline

and its derivatives. Lieut. Pickard, prior to his discharge from the U. S. Army, served as a Medical Supply and Personnel Officer. He will specialize in sales development in connection with a series of new emulsifiers and surface active agents developed by the company during the war.

Hexter Returns To Arco

After three years of special camouflage and intelligence work with the Army Air Forces, Major Paul L. Hexter has returned to the Arco Company, Cleveland paint manufacturers, as vice-president and director of the consumer sales division.

Before entering the service, Maj. Hexter headed the research which led to Arco's development of infra-red reflecting camouflage paints in general use by the Armed Service.

Salas Heads Nuodex Division

Harold M. Johnson, vice-president in charge of sales, of the Nuodex Products Co., Inc., Elizabeth, N. J., announces the appointment of Edward Salas as manager of the company's newly formed Market Development Division.

Preparation for the expansion of Nuodex has created a need for the new division which will be responsible for sales promotion, advertising, sales analyses, and customer research, according to Mr. Johnson.

Mr. Salas formerly handled sales promotion for the Keystone Varnish Co., Brooklyn, N. Y., and has been connected with the Keystone organization for the past seven years.

Kaufhold Directs Dept. At American Ferment

Appointment of Donald S. Kaufhold as director of the newly created professional service department of the American Ferment Company, Inc., is announced by John M. Hawkins, vice-president. The company specializes in products sold under the company's trade mark "Caroid." Mr. Kaufhold has been with American Ferment Company for the past six years. Previously he was associated with a pharmaceutical house in Philadelphia, and at one time was advertising manager of *Medical World*.

Barrett Moves Va. Sales Office

The Barrett Division, Allied Chemical & Dye Corporation, has transferred its sales office for the Norfolk district from Hopewell, Va., to 201 Granby Street, Norfolk, Va. The move has been made better to serve the fertilizer industry in North Carolina and most of Virginia and to facilitate the distribution of nitrate of

soda in that territory. C. J. Ball, sales manager of the Norfolk district and formerly of the Hopewell office, is in charge of the recently opened Norfolk office.

Geigy Explains DDT Insecticides

The appearance of many different DDT insecticide compositions on the market has prompted the Geigy Company, Inc., to offer suggestions for the benefit of both the smaller manufacturers of household insecticides and the public.

There are two types of DDT sprays on the market. These are (1) contact sprays and (2) residual sprays.

Contact Sprays consist of low percentages of DDT (less than 2%) in combination with a fast acting "knockdown" agent, and residual sprays contain 2½% to 5% DDT.

DDT insecticides have gained prominence by reason of their long lasting residual effect. Providing that the proper concentration has been applied, DDT on sprayed surfaces continues killing insects that contact it for many weeks. In order to obtain such results, a 5% solution should be used. As residual sprays, products should be used which plainly state the amount of DDT on the label.

Most of the DDT products now on the market are labeled as 100% active ingredients. Some of these have been found to contain a small amount of DDT with a fast acting knockdown agent to give AA grade fly sprays. Such products are excellent when based on ordinary fly spray performance, but they are designed only to kill the flies and mosquitoes flying about at the time of application and treatment must be repeated as often as the premises are reinfested. It is obvious that such sprays, therefore, preclude the possibility of obtaining results similar to those that have made DDT famous.

Dr. L. L. Williams, Medical Director of the U. S. Public Health Service, in a recent statement urged the public not to accept ineffectual concentrations of DDT and recommended that solutions contain 5% DDT.

The U. S. Department of Agriculture has also urged that the public use solutions containing 5% DDT in order that the products give performance in line with widely publicized reports of experimental work.

The percentage of DDT is not legally required on labels of solution type sprays wherein all components are active, and these are commonly labeled 100% active ingredients. Many reputable manufacturers will label residual type sprays with the percentage DDT. Consumers should expect performance in proportion to the DDT content of the product used. Lacking a statement of DDT content, the product may reasonably be presumed to be effective as a contact spray only and not as a residual spray.

WAR REGULATIONS SUMMARY

ANTI-FREEZE, GLYCERINE BASE—(OPA) Amendment 10 to Maximum Price Regulation 170 went into effect October 15 to increase the ceiling prices for glycerine base anti-freeze 21 cents a gallon, or five cents a quart.

CHANNEL BLACK—(OPA) Maximum Price Regulation 597 and Amendment 10 to Supplementary Regulation 14F to General Maximum Price Regulation, which were effective October 1, established producers' ceiling prices of five cents a pound.

IMPORT CONTROL—(WPB) Revision of General Imports Order M-63 releases the following chemicals from import control: chrome ore, corundum, manganese ore, mica, pyrethrum, cotton linters, and gluestock.

PHOSPHORIC ACID—Amendment No. 5 to Revised Maximum Price Regulation 205 established a new price of 82 cents, effective October 6, for superphosphate loaded at Pocatello, Idaho.

PRIORITIES CONTROL—(WPB) Revision of CR 32 provides that bentonite and furfural, among other things, be removed from inventory control. Certain asbestos products were again placed under control.

Amendment to PR 13, which went into effect October 1, lists items still restricted in domestic special sales: antimony, pig tin, uranium, natural rubber, and certain textiles and fibres. Items restricted on export special sales are: antimony, babbitt, solder, tin, uranium, rubber, and certain textiles and fibres.

Direction 3 has been amended so that WPB preference ratings have no effect on disposal of surplus property to government agencies, except those materials still on priority lists.

RESIDUE GAS—(OPA) Amendment 18 to Revised Maximum Price Regulation 436—Crude Petroleum, and Natural and Petroleum Gas, which took effect October 1, established uniform ceiling prices for residue gas produced in the Texas panhandle area when sold for use in the manufacture of channel carbon black. The new ceilings for both normal and additional production will average 2.75 cents per thousand cubic feet for 'sour" residue gas, and 3.25 cents per thousand cubic feet for "sweet" residue gas.

ROSIN, PRODUCTS CONTAINING 50 PER CENT OR MORE—(OPA) Amendment 8 to Supplementary Regulation 14F to the General Maximum Price Regulation; and Amendment 9 to Maximum Price Regulation 406—Synthetic Resins and Plastic Materials and Substitute Rubber—went into effect September 29, 1945. The formula provides approximately the same amount of adjustment available under previous adjustment provisions at a considerable saving in time for both the industry and OPA.

WHITE LEAD—(WPB) Direction 2 to Order M-384 lifted all restrictions on the use of white lead in the production of paints, varnishes, lacquers and ceramics for the month of September.

ETHYL ALCOHOL—(OPA) Amendment 13 to MPR 28, Amendment 10 to MPR 295, and Amendment 7 to Order 108 under Section 1499.3(b) of the GMPR increases manufacturers' ceiling price of industrial alcohol made from molasses and produced east of the Rockies 2c per gal.

CANADIAN NEWS

by W. A. JORDAN

Pulp and Paper a Growing Chemical Market

FOR the fifth consecutive year new records were established by the Canadian pulp and paper industry in 1944 for gross value of products ($369 million), cost of materials and supplies used ($158 million), salaries and wages paid ($76 million), and cost of fuel, according to a preliminary compilation prepared by the Bureau of Statistics. The volume of pulp and paper produced, however, was practically the same as in 1943, with pulp output constant, and paper production gaining 2 per cent. Price increases accounted for the increase in gross value of output.

Although most of the industry's chemical needs are supplied by domestic producers, substantial tonnages of chemicals are imported from the U. S. A., a brief outline of which may be of interest to U. S. exporters in view of the market's fundamental stability.

The pulpmakers' largest single purchase was 195,000 tons of U. S. sulfur, valued at $5.4 million—down 10,000 tons from last year's figure. Some 48,000 tons of china clay, valued at $987,000 was also imported, in part from the U. S. A., but normally, considering lower landed costs, originating in the main in the United Kingdom. Alum imports—90 per cent from the U. S. A.—totalled 31,000 tons worth $1.1 million.

From the Southern States the papermakers brought in 5,048 tons of rosin, valued at $540,000, as well as 8,129 tons of prepared size listed at $905,000. Dyes and colors worth $510,000 also entered the industry's production, together with $655,000 of "other chemicals" including such items as wetting out agents, foam killers, white oil, waxes, etc., most of which originate in the U. S. A.

Moss Extracts to Be Made in Canada

Dominion Packaging Co., Ltd., Terrebonne, P. Q., is constructing a plant for the manufacture of refined Irish moss extracts, the first of its kind in Canada, and utilizing a process developed by the Department of Applied Biology, National Research Council. (See page 870 this issue for further description of the process.)

Prior to the war, Canada, as had most other countries, relied on imports of agar from Japan, or Irish moss extracts from Ireland or France, for use mainly as stabilizers in chocolate milk, emulsifiers in cosmetics and pharmaceuticals, and as jelling agents in canned foods. More recently, however, wartime conditions have favored the exploitation of Irish moss fields along the Eastern coast, and heavy shipments of the crude material have been exported to the U. S. A. with the refined gelose imported from U. S. processors.

Canadian mills like the above now supply 70 per cent of U. S. consumption of newsprint, with shipments running around 210,000 tons per month.

New Shawinigan V-P

J. A. Fuller has been promoted from secretary-treasurer of Shawinigan Chemicals Ltd. to vice-president of the company. He has also been appointed assistant to the president of the parent company, Shawinigan Water & Power Co. Ltd.

Import and Sales Tax Off

The Canadian government has announced cancellation of the 10 per cent war exchange tax which has been applicable to all imports from non-Empire countries during the past few years, effective as of Oct. 12. Too, the 8 per cent sales tax has been removed from "all machinery and apparatus of production."

The elimination of the former tax improves the competitive position of U. S. exporters of chemicals to Canada, and it is anticipated that the removal of the sales tax on productive machinery, particularly, will be conducive to expanded process equipment purchases.

Aero Dusting of Tomatoes

An experiment to determine the effectiveness of aero-dusting against tomato blight was carried out recently for the first time in Canada in Kent County, western Ontario. The spraying was a joint project of Libby, McNeill and Libby and Canadian Industries, Ltd.

Four fields were dusted with C. I. L.'s "Trox" in an effort to find a more satisfactory method of controlling tomato blight. Results of the aero-dusting are being evaluated at present, and if it proves to be a practical procedure it may

be adopted on a fairly large scale in this tomato-producing area next season.

First Canadian Production of Cellulose Acetate Planned

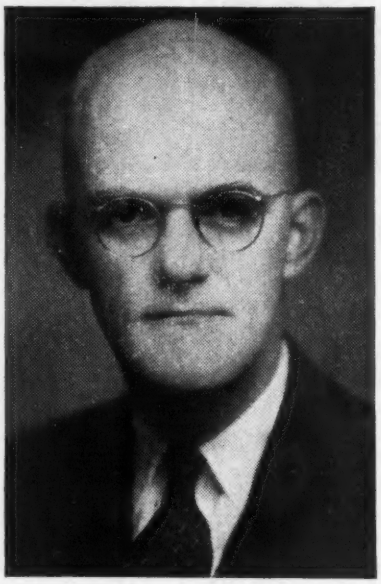
Seelite Plastics Enterprises, Ltd., Toronto, has recently received a government building permit approving plans for the immediate construction of a plant for the manufacture of cellulose acetate molding powders.

The proposed unit, to be erected on a three-acre property in suburban Toronto acquired by the company a few months ago, is to be 125 by 210 feet, with capital investment estimated at $307,000 by President C. M. Nash. It is expected that initial production of the acetate powders will be realized by mid-1946 on a million pound per annum rated capacity basis. Consideration may be accorded to the possibility of manufacturing cellulose acetate sheet material in the future, according to Mr. Nash, but major emphasis is to be placed on powder production for the time being.

The completion of the project will represent the first manufacture of cellulose acetate molding powders in Canada, on a regular basis, for hitherto the Dominion has been dependent mainly on the U. S. A. for imports of $700,000 per annum (1944) of such cellulose molding materials.

As yet the newly-formed company has not made any definite plans as to distribution of its product, and may either market its own output, or appoint one of the established plastics houses as its distributor.

New Tennant Co. Director



J. V. Gundy has been appointed director of Charles Tennant & Co. (Canada) Ltd. A graduate of the University of Toronto in chemical engineering (1921), Mr. Gundy has been with the company since its inception, as manager and later also as treasurer.

New Plant for Boyle-Midway

Boyle-Midway (Canada) Ltd., household chemical specialty manufacturing subsidiary of American Home Products Corporation, has purchased an 18-acre tract a few miles west of Toronto as a site for a new plant to replace the company's present Walkerville, Ont., facilities.

Plans being drafted currently call for an initial unit of approximately 160 by 260 feet with construction to begin next April and to be completed by October.

Upon completion of the new plant, Boyle-Midway will transfer all manufacturing activities from Walkerville to the Toronto factory. The company anticipates that the floor space vacated in Walkerville will be taken over for the expansion of one of the other American Home subsidiaries, probably Wyeth.

British Drug Houses Ltd. Plans Expansion

British Drug Houses (Canada) Ltd., manufacturers of pharmaceutical chemicals, laboratory reagents, and pharmaceutical preparations, has purchased a 17-acre property in Toronto to serve as a site for the implementation of the company's expansion program.

At present, according to Managing Director C. A. Wilkins, the only plans finalized are for the construction of a 40,000 sq. ft., $250,000 unit, which is scheduled to be started next spring and completed by late 1946. The new plant will approximately double the company's productive facilities and permit the manufacture of several new lines for the Canadian market.

Established in Canada 12 years ago, as a subsidiary of the English house of the same name, B. D. H. has restricted its activities essentially to the domestic market with slightly less than 20 per cent of its output channelled to the export trade. No fundamental change in marketing policy is planned with respect to expanded operations.

Colls in Charge of Chemical Operations for C. M. & S.

E. A. G. Colls has been appointed to the newly created position of manager of the Chemicals and Fertilizer Division of Consolidated Mining & Smelting Co. of Canada, Ltd. He will be in charge of all the chemical and fertilizer operations of the company including Alberta Nitrogen Products, Ltd., Calgary, which the company operates for the government. He joined Consolidated in 1923.

MARKET OUTLOOK

Foreign Demand Seen for DDT

One- or Two-Year Penicillin Shortage

Plastics Industry Growth Expected

China Inherits Jap Chemical Industry

Chemicals Soon to Arrive from Japan

●

DDT Export Demand Seen

The price of DDT is leveling off to a point at which it will be competitive with other insecticides including the arsenicals, manufacturers of the material indicated recently. The insecticide is now quoted from 60 cents per pound in five-ton lots.

Meanwhile demands are expected to exceed the supply for the rest of the year. Producers said that no reliable estimates of what potential normal demands and production will settle down to can be made until some time next year. Production was approaching 3,000,000 pounds monthly just before the end of the war. Current total output is believed to be at similar high levels in view of heavy demand for DDT for incorporation in agricultural insecticides for the 1946 season.

Whether production of DDT for agricultural uses, which will ultimately constitute 75 per cent of total requirements, is sufficient to cover needs in 1946 will depend upon factors over which manufacturers have no control, such as the extent of insect infestation, shifting crop acreages, price levels of farm crops which materially determine farmers' purchases of insecticides, export demands and military requirements for occupational armies.

However, several manufacturers announced plans for increasing DDT production to meet civilian requirements when the WPB revoked the stringent controls that governed distribution and use of the material during the war.

The export demand through normal trade channels is heavy considering that the total use of insecticides in foreign countries has never approached the quantities consumed in the United States. Large markets are foreseen in the Middle and Far East as well as in Europe if DDT can be offered at prices attractive to peoples with lower incomes than the United States average.

Short-Term Penicillin Shortage in Prospect

America's producers of penicillin, working at capacity and constantly expanding production, are under greater pressure to meet over-all demand than at any time since mass production was developed.

Producers report that despite a monthly total production of 700,000,000,000 (Oxford) units, or twice what it was last year, penicillin is in extremely short supply. Every producer is straining to manufacture more of the drug, and substantial additions to existing capacity are planned.

Penicillin producers have not been able to expand production as rapidly as they had hoped because of difficulties encountered in handling crude materials such as corn steep and others, and meanwhile, from every corner of the world orders for penicillin are flowing to the United States.

Plants are being rushed overseas, and England may join America early next year in supplying world demand. As yet, however, England is still producing penicillin in bottles as against the deep vat, mass production methods employed in the United States. Two plants are being built in England with the help of American penicillin producers. On completion

Market Review

Heavy Chemicals.—The labor situation during the past month had a considerable influence on the supply of various chemicals, particularly alkalies. Caustic soda, soda ash, and sodium phosphates were especially affected. The wave of strikes will have far-reaching effects, since the automotive industry, for example, is normally a large consumer of heavy chemicals and specialties, such as coating materials, solvents, detergents, lacquers, and the like.

Bichromates, oxalic acid, and calcium chloride continued to remain scarce. Potassium chlorate, permanganate, and citric acid are similarly in short supply, as are nickel salts.

Fine Chemicals.—Mercury declined to a new recent low, but recently the price trend seems to have been reversed, or at least halted. The prices of mercurials are expected to fall in keeping with the cost of the parent metal. Brazilian menthol is still in a weak market position, possibly as a result of the hope that the Far Eastern material will be cheaper. OPA import ceiling prices have kept trade in waxes at a standstill.

Increased fat allotments for household soaps is expected to provide an additional glycerine production of between eight and ten million pounds during the final quarter of the year. Fairly large stocks of alcohol, particularly of solvent grade, presage a declining market. The discovery of 1,600,000 tons of sugar in Java ports will help not only to alleviate the sugar shortage, but will take some pressure off the demand for saccharin, which has been extremely scarce. DDT manufacturers have a large backlog of orders, but current unseasonable buying indicates that wholesalers are putting in large stocks; consequently, production may fall sharply after present orders are filled.

Importation of fine chemicals from Europe is getting under way. A sizable shipment of aniline dyes was received recently from Switzerland.

Quinine salts are in brisk demand. A greatly increased output of synthetic antimalarials resulted from the wartime scarcity of quinine; but the natural product, as in the case of rubber, will undoubtedly find ready acceptance. For some of them, quinidine for example, there is no acceptable substitute.

Coal Tar Chemicals.—Toluene is declining in price because of the large supply released by the cessation of TNT manufacture. The surplus stocks are estimated in the neighborhood of fifteen million gallons. It is possible, however, that the government may require the material for aviation gasoline in view of the petroleum strikes. Strikes and threats of strikes in the coal industry are causing concern over future supplies of cokeoven by-products, such as benzene, nylene, and ammonium sulphate.

Highly competitive conditions are expected to obtain in the aromatic solvents field. The petroleum industry is prepared to meet all future demands.

Naval Stores and Agricultural Chemicals.—Gum turpentine has advanced in price. The output is low, not only because of the critical labor shortage, but also because of heavy rains in producing areas.

The government's announcement that the 1946 farm program calls for a reduction will undoubtedly be reflected in a reduced demand for fertilizers.

they'll produce monthly about 100,000,000,000 units of penicillin apiece—although this output can be speedily expanded.

Canada has a small volume of production, but until additional plants are built, the world must continue to look to the United States for penicillin.

It is felt that the penicillin shortage will persist for at least one or two years—until plant expansion here and abroad begins to catch up with the burgeoning demand.

Plastics Output Increase Foreseen

An additional growth of 20% to 25% in the output of plastics raw materials in the next few years was predicted by W. S. Landes, president of the Plastics Materials Manufacturers Association. Although prices of plastics declined during the war, total dollar volume of the industry increased 325% from 1939 through 1944.

Mr. Landes pointed out that some of the largest uses for plastics will be in paints, varnishes, lacquers, paper coatings, waterproofing, treating textiles, and in plywood. Laminations of plywood with metals offers important possibilities.

China Becomes Chemical Factor

China inherits a huge modern chemical industry from the Japanese. Big Jap-built plants near Peiping and Tientsin escaped unscathed from the war. These factories, which employed German as well as Japanese technicians, bid fair to help speed China's progress as a modern industrial nation and may make that country a factor in the chemical market in the Orient. Just how much of a factor it would be may become more apparent when U. S. Army experts report on their survey of the plants.

Japanese Exports Expected Soon

Officials believe Japanese commerce with the United States may be permitted soon, under military rule, because of the immediacy of some Japanese needs. The country's petroleum supplies are reported exhausted; the nation requires perhaps a million tons of foodstuffs, and perhaps 3 million bales of raw cotton, for textiles. Since it is denied relief as a former enemy, it can get what it needs only by selling.

The first shipments, it is expected, will be from commodity stockpiles accumulated in Japan. No one here seems to have accurate information on what surpluses may be available for export from Japan, but there are reports that raw silk, tea, camphor, pyrethrum and even gold stocks may be used. More time would be required for Jap factories to get into production of consumer goods for export.

Liquefied Petroleum Gas Sales Up

The percentage rate of gain in annual sales of liquefied petroleum gases declined from 27 per cent in 1942 to 15 per cent in 1943, however it turned sharply upward in 1944 when comparative deliveries of 905,600,000 gallons were 34 per cent above the 1943 total of 675,233,000 gallons, according to a survey made by the Bureau of Mines, United States Department of the Interior. The 1944 survey was extended to cover material delivered for synthetic rubber components, and when this additional demand is included the 1944 quantity expands to 1,061,809,000 gallons—a total realized in spite of war-time regulations, equipment and transportation difficulties, and ever increasing diversions to satisfy the demand for aviation-grade motor fuel and possible because of greatly increased production of liquefied petroleum gases from both old and new plants.

Omitting sales of material reported for synthetic rubber components so that 1943 and 1944 items will be on a comparative basis, all principal uses of liquefied petroleum gases showed greater percentage gains in 1944 than in 1943, except the demand for industrial fuel, which expanded at a lesser rate than in 1943, and "All other uses," which registered a loss in 1944. The percentage increases in 1944 were quite different from those in 1943, when the demand for industrial fuel showed a larger gain and other principal uses smaller rates of expansion than in 1942.

A greatly stepped-up use of liquefied petroleum gases as raw materials for chemical manufacturing is indicated in sales of 151,985,000 gallons for this purpose in 1944—a quantity nearly triple the 1943 demand of 55,356,000 gallons. Part of this growth reflects expansion under war conditions, however some of it is due to more complete reporting of this demand in 1944 than in 1943.

Deliveries of butane declined 5 per cent, from 140,122,000 gallons in 1943 to 132,870,000 in 1944, as restrictions governing certain uses were enforced and larger quantities were diverted for raw material to the synthetic rubber and chemical industries.

The use of butane as raw material in the manufacture of chemicals showed a strong upward trend in 1944, and the demand of 23,475,000 gallons was far above the 1943 total of 7,972,000 gallons.

Changes in the principal demands for butane stand out when reviewed with respect to the percentage angle of total sales. Butane reported for domestic fuel has declined from 35 per cent of all demands in 1942 to 32 per cent in 1943 and down sharply to 21 per cent in 1944. The proportion of butane consumed as motor fuel has shown a similar downward trend from 12 per cent of all requirements in 1942 to 3 per cent in 1944. Butane credited as industrial fuel has remained fairly constant at about 40 per cent of all principal uses in recent years but the percentage share sold to manufactured-gas companies of 19 per cent in 1944 is double the 1942 proportion. The percentage of butane sales reported for chemical raw material mounted sharply from 6 per cent in 1943 to 18 per cent of the 1944 total.

Sales of propane for raw material to chemical manufacturing plants jumped from 4,455,000 gallons in 1943 to 40,666,000 in 1944.

Deliveries of butane-propane mixtures in 1943 were little above the 1942 total, but in 1944 when there were difficulties in obtaining enough butane for all purposes there was a general turning to both propane and to butane-propane mixtures for fuel and for raw materials in the chemical industry. Reported sales of "mixtures" increased by 44 per cent from 312,683,000 gallons in 1943 to 448,882,000 in 1944 and the expansion was limited largely to domestic-fuel and chemical-manufacturing demands. "Mixtures" delivered as raw material to chemical plants made up 20 per cent of the 1944 total (13 per cent in 1943), and the quantity more than doubled from 39,584,000 gallons in 1943 to 87,844,000 in 1944.

Relatively more butane-propane mixtures are reported for chemical raw material than the other liquefied petroleum

SALES OF LIQUEFIED PETROLEUM GASES IN THE UNITED STATES, 1938-44
(Thousands of gallons)

Year	Butane	Propane	Butane-propane mixtures	Pentane	Total: Quantity	Total: Percentage increase over previous year
1938	52,768	54,130	56,050	2,253	165,201	16.8
1939	71,351	79,323	69,020	3,886	223,580	35.3
1940	77,056	109,216	123,348	3,836	313,456	40.2
1941	112,244	126,969	219,252	4,387	462,852	47.7
1942	128,560	150,511	301,917	4,452	585,440	26.5
1943	140,122	218,273	312,683	4,155	675,233	15.3
1944[1,2]	277,240	335,377	449,192	(4)	1,061,809	57.3
1944[1,3]	132,870	323,848	448,882	(4)	905,600	34.1

[1] Subject to revision. [2] Includes material delivered for synthetic rubber components. [3] Material delivered for synthetic rubber components omitted to compare with 1943 totals. [4] Figures not available.

CELLULOSE PLASTIC PRODUCTS, MAY AND JUNE, 1945
(In pounds)

The information on cellulose plastic products given in this report differs slightly from that in previous reports, but with certain combinations and, as qualified in the footnotes to the table, the statistics are approximately comparable with those previously released. While production data are no longer required, an attempt has been made to obtain data for total disappearance, i. e., shipments, transfers and consumption in reporting company plants.

For the month of June, the total of continuous sheeting (.003 gauge and upward) and "all other" sheets is comparable to the figures shown for cellulose acetate sheets, rods and tubes in previous reports, except that data for a small amount of rods and tubes were formerly included. Since the separate data reported for June for cellulose acetate rods and tubes cannot be shown without disclosing the operations of individual establishments, they are entirely excluded from the June figures.

The statistics for cellulose molding and extrusion material include data for cellulose acetate and cellulose acetate butyrate material. Prior to June, no data on the consumption for producing companies of molding and extrusion material were collected. Consumption in producing plants in June was small, however, so that comparability with May and earlier months is not greatly affected. The June statistics for nitrocellulose products are entirely comparable with those previously issued. Separate statistics for consumption in reporting company plants are shown in appropriate footnotes where operations of individual companies are not disclosed.

Figures for prior months which were withheld from publication for security reasons during the war are available from the Bureau of the Census in releases dated March 2, 1945, and July 9, 1945. Data for a number of additional plastic materials, including phenolic and other tar acid resins, urea resins and vinyl resins, will be available in the next few months. With the publication of these figures, a fairly complete record of current operations in the plastics and synthetic resins industry will be available.

Item	June: Consumption, shipments and transfers	May: Consumption, shipments and transfers
Cellulose acetate and mixed ester plastics:		
Sheets:		
Continuous (under .003 gauge)	659,548	.....
Continuous (over .003 gauge)	372,583	
All other sheets	[2]354,302	[1]795,839
Total	1,386,433	.....
Cellulose molding and extrusion material	4,769,688	[3]4,888,118
Nitrocellulose:		
Sheets	[4]742,993	[4]779,222
Rods and tubes	504,762	604,691

[1] Includes data for a small amount of cellulose acetate rods and tubes, figures for which cannot be shown separately due to disclosure of operations of individual companies. Data for cellulose acetate rods and tubes are not included in the June figures.
[2] Includes 17,835 pounds of cellulose acetate sheets consumed in reporting company plants.
[3] Includes data for shipments and transfers only, no data having been collected for consumption of cellulose acetate molding composition in reporting company plants.
[4] Includes 90,348 pounds of nitrocellulose sheets consumed in reporting company plants.
[*] Revised.

gases; however the percentage for "mixtures" has declined sharply from 89 per cent of the total in 1941 to 58 per cent in 1944. Butane delivered to chemical plants has increased from less than 1 per cent of the total in 1941 to 15 per cent in 1944, but the proportion of propane has advanced intermittently from 4 per cent of the demand in 1941 to 27 per cent in 1944. Pentane satisfied about 7 per cent of the chemical demand for liquefied petroleum gases from 1941 to 1943.

Abrasive Output Declines in 1944

Output of the abrasives industries in 1944 totaled 1,340,909 short tons valued at $34,403,056, and was only slightly under that of the industrially active year 1943, according to the Bureau of Mines, United States Department of the Interior. Domestic production of natural abrasives in 1944 amounted to 954,505 short tons valued at $9,575,038, or 71 and 28 percent of the total tonnage and value respectively, of all abrasives for which data are included herein. Output of artificial abrasives in 1944 continued at a high level and was but 6 percent below 1943, the record year for these products. Ground sand and sandstone, and metallic abrasives rose to new highs. Average annual sales of diatomite for the three-year period 1942-44 were substantially higher than for similar periods heretofore reported. Marketed production of emery, pumice and pumicite, and tripoli were larger than in 1943. Domestic production of most of the other natural abrasive products herein discussed was somewhat less in 1944 than in 1943.

Diatomite. The Bureau of Mines has not been at liberty to publish annual production statistics since 1926. Total output (sales) for 3-year periods, however, may be shown. Total sales for the three most recent of such periods were as follows: 1942-44, 524,872 short tons valued at $9,894,534; 1939-41, 360,502 tons valued at $5,746,216; and 1936-38, 279,645 tons valued at $4,377,353. The totals for the 1942-44 period are the highest yet reached and indicate record outputs in recent years for this product.

Tripoli.—Output of tripoli in 1944 increased 24 percent in both quantity and value compared with 1943, although considerably under other recent years.

Quartz.—Sales of crude, crushed and ground quartz from pegmatite veins or dikes and from quartzite in 1944 were 17 percent less than in 1943, in both quantity and value. The total crude quartz sold in 1944 rose nearly 150 percent compared with 1943. A large drop in output of crushed quartz and a sizable decrease in reported sales of ground material were the chief factors in the overall decline. Total sales in 1944, however, were higher than in any recent year other than 1943, although the average value per ton in 1943 and 1944 remained the same.

CHEMICALS: UNITED STATES PRODUCTION, CONSUMPTION, AND STOCKS, JUNE AND JULY, 1945

Statistics on the production, consumption and stocks of chemicals shown in the following table supplement the 1941-1943 figures released February 7, 1944, in "Facts for Industry," Series 6-1-1. Figures for earlier months, information on the number of plants manufacturing each chemical, and a discussion of the limitations of the data are given in the above-mentioned publication. The production figures represent primary production and do not include purchased or transferred material. The consumption statistics are for consumption only in the plants where each chemical is produced. The stocks figures represent the quantities of each chemical on hand at the end of the month at producing locations only.

		July (Preliminary)			*June (Revised)*		
Chemical and Basis	*Unit*	*Production*	*Consumption in producing plants*	*Stocks at producing plants, end of month*	*Production*	*Consumption in producing plants*	*Stocks at producing plants, end of month*
Acetylene:							
For use in chemical synthesis	M cu. ft.	(1)			311,832		
For commercial purposes	M cu. ft.	(1)	(1)	(1)	*125,111	71,209	8,727
Aluminum chloride:							
Anhydrous and crystal (100% $AlCl_3$)	M pounds	4,770	(2)	1,753	5,088	(2)	1,801
Solution (32° Be')	M pounds	639	....	326	945	....	515
Aluminum sulfate:							
Commercial (100% $Al_2(SO_4)_3$)	M pounds	(3)	(3)	(3)	(3)	(3)	(3)
Iron free (100% $Al_2(SO_4)_3$)	M pounds	(3)	(3)	(3)	(3)	(3)	(3)
Synthetic anhydrous ammonia (100% NH_3)[4]	Short tons	47,431	34,347	4,799	45,072	27,416	3,225
Ammonium chloride (100% NH_4Cl)	M pounds	5,233	....	1,619	5,699	....	1,493
Barium sulfate (Blanc fixe') (100% $BaSO_4$)	M pounds	4,531	3,011	5,622	4,480	3,013	5,297
Bleaching powder (35-37% Available Cl_2)	M pounds	2,126	....	837	2,142	....	683
Calcium acetate (80% $Ca(C_2H_3O_2)_2$)	M pounds	591	....	166	658	....	123
Calcium arsenate (100% $Ca_3(AsO_4)_2$)	M pounds	4,606	267	13,793	5,157	445	13,950
Calcium carbide (Commercial)	Short tons	(1)	(5)	(1)	63,134	(5)	26,770
Calcium hypochlorite (rue) (70% Available Cl_2)	M pounds	1,273	(2)	633	1,181	(2)	668
Calcium phosphate:							
Monobasic (100% $CaH_4(PO_4)_2$)	M pounds	4,693	(2)	4,242	4,806	(2)	4,472
Dibasic (100% $CaHPO_4$)	M pounds	3,589	(2)	1,161	2,593	(2)	933
Carbon, activated	M pounds	5,267	(2)	6,255	5,257	(2)	6,021
Carbon black (Channel):							
Rubber grade	M pounds	43,700	....	20,114	*40,619	....	*12,487
Other than rubber grade	M pounds	2,647	....	9,808	*2,835	....	*10,423
Carbon dioxide:							
Liquid and gas	M pounds	(1)	(1)	(1)	*18,572	2,614	*1,896
Solid (dry ice)	M pounds	(1)	....	(1)	*65,789	....	*17,829
Chlorine	Short tons	105,189	61,963	6,977	106,699	61,281	6,969
Chrome green (C. P.)	M pounds	411	53	808	351	54	939
Chrome yellow and orange (C. P.)	M pounds	2,954	282	1,672	3,223	321	1,802
Copper acetoarsenite (Paris green)	M pounds	(1)	(2)	(1)	375	(2)	767
Hydrochloric acid (100% HCl)	Short tons	35,891	24,196	3,326	37,348	25,104	3,470
Hydrogen	Millions of cubic feet	(1)	(1)	(5)	*2,155	*1,779	(5)
Hydrogen peroxide (100 volumes)	M pounds	2,514	80	300	2,627	90	829
Lamp black	M pounds	1,283	(2)	407	1,375	(2)	512
Lead arsenate (acid and basic)	M pounds	(1)	(1)	(1)	5,485	171	9,406
Iron blue (C. P.)	M pounds	723	95	849	774	82	825
Lead oxide:							
Red (C. P.)	M pounds	7,748	241	4,080	8,909	263	3,706
Yellow (C. P.)	M pounds	26,488	6,754	9,793	*26,986	6,802	*8,901
Methanol:							
Natural (100% CH_3OH)	M gallons	233	(5)	404	**250	(5)	**458
Synthetic (100% CH_3OH)	M gallons	6,318	(2)	5,514	6,012	(2)	5,664
Molybdate chrome orange (C. P.)	M pounds	59	(2)	64	130	8	125
Nitric acid (100% HNO_3)	Short tons	38,944	33,772	5,882	39,662	33,698	6,060
Nitrous oxide	M gallons S. T. P.	(1)	....	(1)	*13,511	....	*3,319
Oxygen	M cu. ft.	(1)	(1)	(6)	*1,233,506	22,705	(6)
Phosphoric acid (50% H_3PO_4)	Short tons	60,002	53,905	14,993	*61,438	*53,749	14,967
Potassium bichromate and chromate (100%)	M pounds	459	....	265	434	....	*477
Potassium hydroxide (caustic potash) (100% KOH)	Short tons	4,738	702	2,818	4,751	758	2,231
Soda ash (Commercial sodium carbonate):							
Ammonia soda process—							
Total wet and dry (98-100% Na_2CO_3)[7]	Short tons	358,217	....	....	358,782	....	....
Finished light (98-100% Na_2CO_3)[8]	Short tons	192,842	52,412	18,068	189,444	47,012	21,258
Finished dense (98-100% Na_2CO_3)	Short tons	121,122	1,216	10,042	115,675	2,338	8,023
Natural[9]	Short tons	(3)	....	(3)	15,980	....	2,913
Sodium bicarbonate (refined) (100% $NaHCO_3$)	Short tons	11,332	(2)	3,933	13,954	(2)	4,161
Sodium bichromate and chromate (100%)	Short tons	6,244	(2)	672	5,951	(2)	483
Sodium bisulfite (100% $NaHSO_3$)	M pounds	1,438	(2)	654	3,665	(2)	1,155
Sodium hydrosulfide (100% NaSH)	M pounds	2,446	(2)	496	2,099	(2)	348
Sodium hydrosulfite (100% $Na_2S_2O_4$)	M pounds	3,184	(2)	898	3,152	(2)	815

CHEMICALS: UNITED STATES PRODUCTION, CONSUMPTION, AND STOCKS, JUNE AND JULY, 1945 (*Cont'd*)

Chemical and Basis	*Unit*	*July (Preliminary)* Production	*July (Preliminary)* Consumption in producing plants	*July (Preliminary)* Stocks at producing plants, end of month	*June (Revised)* Production	*June (Revised)* Consumption in producing plants	*June (Revised)* Stocks at producing plants, end of month
Sodium hydroxide (caustic soda):[10]							
Electrolytic process—							
Liquid (100% NaOH)	Short tons	100,920			101,461		
Solid (100% NaOH)	Short tons	19,302			19,128		
Lime-soda process—			37,575	49,837		*38,249	*48,786
Liquid (100% NaOH)	Short tons	56,724			58,974		
Solid (100% NaOH)	Short tons	19,455			21.382		
Sodium phosphate:							
Monobasic (100% NaH_2PO_4)	Short tons	(3)	(2)	(3)	1,244	(2)	272
Dibasic (100% Na_2HPO_4)	Short tons	(3)	(2)	(3)	5,621	(2)	517
Tribasic (100% Na_3PO_4)	Short tons	(3)	(3)	(3)	7,198	231	1,421
Meta (100% $NaPO_3$)	Short tons	(3)	(2)	(3)	2,466	(2)	198
Tetra (100% $Na_4P_2O_7$)	Short tons	(3)	(3)	(3)	3,631	67	630
Sodium silicate:							
Soluble silicate glass, liquid and solid (anhydrous)	Short tons	32,060	2,607	56,175	43,733	3,113	57,901
Sodium sulfate:							
Anhydrous (refined) (100% Na_2SO_4)	Short tons	(1)	(2)	(1)	5,715	(2)	2,144
Glauber's salt (100% $Na_2SO_4.10H_2O$)	Short tons	(1)	(2)	(1)	19,352	(2)	4,420
Salt cake (crude) (commercial)[9]	Short tons	(1)	(1)	(1)	42,207	3,707	68,533
Sulfur dioxide	M pounds	(1)	(1)	(1)	6,879	3,479	2,532
Sulfuric acid:[9]							
Total (100% H_2SO_4)	Short tons	842,941			822,409		
Chamber process (100% H_2SO_4)	Short tons	251,504	....	....	254,975	....	....
Contact process (100% H_2SO_4)[11]	Short tons	591,437	....	250,837	567,434	....	226,652
Net, contact process (100% H_2SO_4)[11, 12]	Short tons	511,627	....	....	481,561	....	....
White lead:							
Basic lead carbonate (C. P.)	Short tons	3,251	892	2,439	3,540	1,852	2,383
Basic lead sulfate (C. P.)							
Zinc yellow (zinc chromate)	Short tons	918	....	146	1,091	....	627
(C. P.)	Short tons	1,309	(2)	473	1,520	(2)	371

[1] Data by months are collected on a quarterly report form and are presented in release in this "Facts for Industry" series covering the months of March, June, September and December.
[2] Data cannot be published without disclosing operations of individual establishments.
[3] Not yet available.
[4] Data for a small amount of aqua ammonia are included in the figures reported by one company.
[5] Not available; see "Facts for Industry," Series 6-1-1.
[6] Data for oxygen stocks are no longer collected.
[7] Total wet and dry production, including quantities diverted for manufacture of caustic soda and sodium bicarbonate, and quantities processed to finished light and finished dense soda ash. For detailed discussion of soda ash statistics, see "Facts for Industry," Series 6-1-1.
[8] Not including quantities converted to finished dense soda ash.
[9] Natural soda ash, crude salt cake and sulfuric acid data collected in cooperation with Bureau of Mines.
[10] Production figures represent total production of liquid material, including quantities evaporated to solid caustic and reported as such. Consumption figures represent quantities of both liquid and solid caustic consumed in producing plants exclusive of quantities of liquid caustic evaporated to solid. Stock figures include quantities on hand of liquid and solid material.
[11] Includes sulfuric acid of oleum grades.
[12] Excludes spent acid. For detailed explanation see "Facts for Industry," Series 6-1-1.

* Revised.
** Reporting basis changed from (80% CH_3OH) to (100% CH_3OH) beginning June 1945. Data for previous months should be adjusted accordingly to provide comparability.

(Refer inquiries concerning these data to the Bureau of the Census, Washington 25, D. C.)

CHEMICALS: UNITED STATES PRODUCTION, CONSUMPTION, AND STOCKS APRIL, 1945

(Supplement to April report, dated June 22, 1945)

Chemical and Basis	*Unit*	*Production*	*Consumption in producing plants*	*Stocks at producing plants, end of month*
Acetylene:				
For use in chemical synthesis	M cu. ft.	339,483		
For commercial purposes	M cu. ft.	131,868	78,567	9,846
Calcium carbide (commercial)	Short tons	64,610	(4)	23,704
Carbon dioxide:				
Liquid and gas	M pounds	17,578	2,736	2,683
Solid (dry ice)	M pounds	63,076	....	15,616
Copper acetoarsenite (Paris green)	M pounds	536	(1)	827
Hydrogen	Millions of cubic feet	2,100	1,759	(4)
Lamp black[5]	M pounds	*1,196	....	485
Lead arsenate (acid and basic)	M pounds	9,737	502	6,932
Nitrous oxide	M gallons S.T.P.	13,491	....	3,025
Oxygen	M cu. ft.	1,401,301	32,082	(6)
Sodium phosphate:				
Monobasic (100% NaH_2PO_4)	Short tons	1,535	(1)	169
Dibasic (100% Na_2HPO_4)	Short tons	4,850	(1)	456
Tribasic (100% Na_3PO_4)	Short tons	7,312	259	1,126
Meta (100% $NaPO_3$)	Short tons	2,023	(1)	295
Tetra (100% $Na_4P_2O_7$)	Short tons	3,597	91	582
Sodium sulfate:				
Anhydrous (refined) (100% Na_2SO_4)	Short tons	6,799	(1)	2,672
Glauber's salt (100% $Na_2SO_4.10H_2O$)	Short tons	18,228	(1)	3,796
Salt cake (crude) (commercial)[9]	Short tons	43,534	4,141	54,913
Sulfur dioxide	M pounds	6,124	3,479	2,433

Ground sand and sandstone.—Sales of ground sand and sandstone in 1944 rose 3 percent in quantity and 1 percent in value compared with 1943, and totaled 558,606 short tons, valued at $3,989,981, a new high in both tonnage and value. Production each year since 1938 has been larger than in the preceding year.

Abrasive sands.—Natural sands with a high silica content are employed for sand blasting, stone polishing, glass grinding, coating sandpaper, or other abrasive purposes. Total sales of such grinding and polishing sand in 1944 amounted to 897,983 short tons valued at $1,563,511, compared with 837,662 tons valued at $1,428,463 in 1943, or an increase of 7 percent in tonnage and 9 percent in value. Included in these data in 1944 were 482,293 tons of blast sand valued at $1,228,744 and in 1943, 450,997 tons valued at $1,138,003.

Pumice and pumicite.—Output of pumice and pumicite in 1944 increased 4 percent in tonnage and 15 percent in value compared with 1943, although it was still considerably under the high levels of 1941 and 1942. Sales in 1944 were, however, larger than in any year previous to 1941.

Garnet.—Sales of abrasive garnet in 1944 were somewhat less than in 1943, although the Bureau of Mines is not at liberty to publish production data.

Corundum.—Until 1943, no production of natural corundum had been reported in the United States since 1917 and 1918, and none previous to those years since 1906. Although a small output of corundum occurred in 1943 and 1944 for test purposes, this project has been discontinued. Activity in North Carolina and Montana at the end of 1944 had not progressed beyond experimental stages.

Most of the corundum used in this country for many years has been obtained from the Union of South Africa, which in most normal years has maintained a fairly steady supply, despite distance of market and transportation difficulties. In the last year or so, however, production has not kept pace with demand and efforts in the Union and plans of the Foreign Economic Administration to secure wider and better exploitation have not achieved the desired results. Supplementing the corundum from Union of South Africa, shipments of small quantities from other countries have occasionally been received, including material recovered from tailings dumps. A general discussion of corundum appeared late in 1944 (Bureau of Mines Information Circular 7295, by Robert W. Metcalf, 18 pages).

Emery.—Sales of domestic emery in 1944 increased 4 percent in quantity and 3 percent in value compared with 1943, and reached 6,940 short tons valued at $64,858. This is the highest figure since 1918.

Artificial abrasives.—Total production of artificial abrasives in 1944 aggregated

386,404 short tons valued at $24,828,018, or 6 per cent less in tonnage and 5 per cent less in value than in 1943. The combined total, however, of these manufactured abrasive products—silicon carbide, aluminum oxide and metallic abrasives (steel shot and grit)—was larger than in any year except 1943. Production of silicon carbide in 1944 decreased 19 per cent in quantity and 20 per cent in value compared with 1943, this decline approximating the drop in used capacity—98 per cent in 1943 and 78 per cent in 1944. The output of aluminum oxide in 1944 was 15 per cent under 1943 and similarly reflected operation at considerably under capacity—79 per cent in 1944 compared with 98 per cent in 1943. Shipments of metallic abrasives (steel shot and grit) rose in 1944 to a new record in both quantity and value—144,540 short tons valued at $8,441,505, or 16 per cent higher in tonnage and 19 per cent higher in value than in the previous peak year (1943). Operation was at 75 per cent of capacity.

Production of silicon carbide and aluminum oxide largely is concentrated in the Niagara Falls region of Canada and the United States; some aluminum oxide however, is produced in Quebec (Canada) and in Alabama. The same companies that produced aluminum oxide and silicon carbide in 1943 and other recent years were active in 1944. Included in the total for aluminum oxide in 1944 were 25,868 short tons of "white high purity or special" material, valued at $2,847,167, a decrease of 8 per cent in quantity and 11 per cent in value compared with 1943. Silicon carbide consumed in refractory or nonabrasive uses in 1944 was estimated at 43 per cent of total production compared with 41 per cent in 1943 and 35 per cent in 1942. Similar data for aluminum oxide indicate only a small percentage of total output employed for nonabrasive or refractory purposes—3 per cent in 1944, 4 per cent in 1943 and 3 per cent in 1942.

Barite Output Rises

Production of primary barite in the United States was 177,377 short tons in the second quarter of 1945 compared with 125,070 for the comparable period of 1944, according to preliminary compilations of the Bureau of Mines, United States Department of the Interior. Primary barite includes and is limited to ground barite produced at El Portal, Calif., and Malvern, Ark., and all crude, lump, and pebble barite except a small amount of hand-mined material not covered in the canvass.

The Japanese surrender brought no immediate relief to barite miners east of the Mississippi, who were still faced with shortages of labor and materials, particularly trucks and tires. Temporary declines in demand for certain grades of barite may be experienced in converting to a peacetime economy, but the over-all market outlook even during the early stages of reconversion is encouraging. The demand for well-drilling material and lithopone-grade barite is expected to continue. Requirements for barite in chemicals should not decline heavily despite cuts in military orders, as nearly all the barium chemical intermediates have well-recognized peace-time outlets.

A new producer of glass barite, Acme Barite Co., Mineral Point, Mo., began operations during the second quarter, and two new grinders, Xact Clays, Inc., Potosi, Mo., plant at Tiff, Mo., and Missouri Barium Co., Kinder, La., shipped to glassmakers and well drillers, respectively, during the period. Hafner Thorn Mining Co. erected a washer at Potosi, Mo.

Sulfur Sales at Record Levels

Activity in the sulfur industry was at peak rates in July 1945 according to reports of producers to the Bureau of Mines, United States Department of the Interior. More sulfur was shipped from the mines than in any previous month, and sales were at record levels. Production was also very high but was unable to keep pace with consumption, and stocks declined 78,381 long tons.

PRODUCTION, MINE SHIPMENTS, APPARENT SALES, AND PRODUCERS' STOCKS OF NATIVE SULFUR IN THE UNITED STATES IN SELECTED PERIODS, 1944-45, IN LONG TONS

Period	Production	Mine shipments	Apparent sales*	Producers' stocks**
June 1945	309,570	416,272	370,916	3,776,738
July 1945	313,391	457,970	391,772	3,698,357
June 1944	380,545	311,199	312,182	4,168,394
July 1944	305,064	291,890	319,109	4,154,349

* Calculated from production and change in stocks during the period.
** Producers' stocks at mines, in transit, and in warehouses at end of period.

SYNTHETIC ORGANIC CHEMICALS: UNITED STATES PRODUCTION, CONSUMPTION, AND STOCKS
(In pounds, except that creosote oil is expressed in gallons.)

The data given in the following table supplement the figures released beginning March 1, 1944, in the Facts for Industry Series 6-2-1 to 6-2-19. Information concerning the limitations of the data, the completeness of coverage, and the selection of items were given in the Series 6-2-1 report.

In the table, production (except as noted in footnote 10) includes material produced whether consumed in the producing plants or sold. Consumption represents consumption at producing plants only; it includes material produced in such plants, or material purchased or transferred from other plants. Stocks are company stocks, as of the last day of the year or month, located at plant, in transit, or in warehouse, and include purchased as well as produced material.

	July 1945		
	Production	Consumption	Stocks
Acetanilide (technical and U. S. P.)	595,884	142,107	237,424
Acetic acid (synthetic)[1]	20,459,033	20,066,370	8,048,112
Acetic acid (natural, including that from calcium acetate)[2]	2,896,968	[4]	2,098,028
Acetic anhydride[3]	43,866,916	27,311,478	[4]
Acetylsalicylic acid (Aspirin)	813,540	[4]	1,098,673
n-Butyl acetate	4,709,465	131,536	3,790,801
Creosote oil, tar distillers[5]	9,840,860	769,160	7,666,677
Creosote oil, byproduct[6]	3,051,086	29,378	985,609
Cresols, meta-para[7]	544,690	[4]	311,918
Cresols, ortho-meta-para[7]	813,723	.....	[4]
Cresylic acid, crude	2,347,728	[4]	953,212
Cresylic acid, refined[7]	2,375,299	[4]	1,316,718
Diethyl ether (all grades)	7,223,495	[4]	2,887,655
Ethyl acetate (85 per cent)	9,455,760	1,383,164	5,331,824
Lactic acid (edible)	Published quarterly		
Lactic acid (technical):	Published quarterly		
Methyl chloride (all grades)	2,459,751	[4]	580,740
Naphthalene, less than 79° C. (coke-oven operators)[8]	7,715,663	.....	3,443,719
Naphthalene, less than 79° C. (tar distillers)[9]	17,014,259[10]	[4]	6,868,855
Naphthalene, refined (79° C. and over)	6,685,383	3,555,101	911,149
Oxalic acid (technical)	1,714,185	[4]	364,749
Phenobarbital and sodium salts	24,442	[4]	30,467
Phthalic anhydride	10,934,029	3,193,744	2,494,086
Riboflavin (for human use)	6,410	[4]	21,718
Sulfa drugs (total)[11]	539,683	75,167	571,019

[R] Revised.
[1] Excludes statistics on recovered acetic acid, which are confidential.
[2] Natural acetic acid (produced by direct process from wood) and acetic acid distilled from calcium acetate. These statistics are collected and compiled by the U. S. Bureau of the Census.
[3] Represents all acetic anhydride, including that produced from acetic acid by the vapor-phase process.
[4] Confidential; publication would disclose operations of individual companies.
[5] Product of distillers who use purchased coal tar only.
[6] Product of byproduct coke-oven operators only. These statistics are collected and compiled by the Coal Economics Division, U. S. Bureau of Mines.
[7] Statistics represent total production, consumption, and stocks, including both data reported by coke-oven operators to the Coal Economics Division, Bureau of Mines, and data reported by distillers of purchased coal tar to the U. S. Tariff Commission. Data reported to the two agencies are combined to prevent the disclosure of the operators of individual companies.
[8] Includes only the production, consumption and stocks of coke-oven operators. Statistics combine the three grades (solidifying at less than 74° C., at 74° C. to less than 76° C., and at 76° C. to less than 79° C.) in order to prevent the disclosure of the operations of individual companies. These statistics are collected and compiled by the Coal Economics Division, Bureau of Mines.
[9] Includes only the production, consumption and stocks of distillers of purchased coal tar. Statistics combine the grades specified in footnote 8, in order to prevent the disclosure of the operations of individual companies.
[10] For the grade solidifying at less than 74° C., these statistics represent production for sale only; for the other two grades, they represent production both for consumption within the producing plant and for sale. Production for consumption of the grade solidifying at less than 74° C. is excluded in order to minimize duplication as this grade is frequently converted to grades of higher melting point.
[11] Includes acetylsulfathiazole produced both as a sulfa drug and as an intermediate, resulting in an appreciable duplication which is unavoidable.
Source: Statistics collected and compiled by the U. S. Tariff Commission, except where otherwise noted.

(Refer all inquiries concerning these data to the United States Tariff Commission, Washington 25, D. C.)

CURRENT PRICES

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00
October, 1943, $0.899 October, 1944, $0.881
October, 1945, $0.867

		Current		1944		1943	
		Low	High	Low	High	Low	High
Acetaldehyde,99%,drs.wks.	lb.	.11	.14	.11	.14	.11	.14
Acetic Anhydride, drs,	lb.	.11½	.13	.11½	.13	.11½	.13
Acetone, tks, delv.	lb.	.06	.07	...	.07	...	.07
ACIDS							
Acetic, 28%, bbls	100 lbs.	3.38	3.63	3.38	3.63	3.38	3.63
glacial, bbls.	100 lbs.	9.15	9.40	9.15	9.40	9.15	9.40
tks, wks.	100 lbs.	6.93	7.25	6.93	7.25	...	6.93
Acetylsalicylic, Standard USP	lb.	.40	.54	.40	.54	.40	.54
Benzoic, tech. bbls.	lb.	.43	.47	.39	.47	.39	.47
USP, bbls, 4,000 lbs. up	lb.	...	.54	...	.54	...	.54
Boric tech, bbls, c-l.	tons *a*	...	109.00	...	109.00	...	109.00
Chlorosulfonic, drs, wks.	lb.	.03	.04½	.03	.04½	.03	.04½
Citric, USP, crys, gran, bbls.	lb. *b*	.20	.21	.20	.21	.20	.24
Cresylic 50%, 210-215° HB, drs. wks. frt. equal	gal.	.81	.83	.81	.83	.81	.83
Formic, 85%-90% cbys.	lb.	.10	.11½	.10	.11½	.10½	.11½
Hydrofluoric, 30% rubber, dms.	lbs.	.08	.09	.08	.09	.08	.09
Lactic, 22%, lgt, bbls wks	lb.	.039	.0415	.039	.0415	.039	.0415
44%, light, bbls wks	lb.	.073	.0755	.073	.0755	.073	.0755
Maleic, Anhydride, drs	lb.	.25	.26	.25	.26	.25	.26
Muriatic, 18° cbys	100 lb.	1.50	2.45	1.50	2.45	1.50	2.45
20° cbys, c-l, wks.	100 lb.	...	1.75	...	1.75	...	1.75
22° cbys, c-l, wks	100 lb.	...	2.25	...	2.25	...	2.25
Nitric,36°,cbys, wks 100 lbs. *c*		5.00	5.25	5.00	5.25	5.00	5.25
38°,,c-l, cbys, wks 100 lbs. *c*		...	5.50	...	5.50	...	5.50
40°, c-l, cbys, wks 100 lbs. *c*		...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks 100 lbs. *c*		...	6.50	...	6.50	...	6.50
Oxalic, bbls, wks	lb.	.11¼	.12½	.11¼	.12½	.11¼	.12½
Phosphoric, 100 lb. cbys, USP	lb.	.10½	.13	.10½	.13	.10½	.13
Salicylic, tech, bbls	lb.	.26	.42	.26	.42	.26	.44
Sulfuric, 60°, tks, wks	ton	...	13.00	...	13.00	...	13.00
66°, tks, wks	ton	...	16.50	...	16.50	...	16.50
Fuming 20% tks, wks.	ton	...	19.50	...	19.50	...	19.50
Tartaric, USP, bbls	lb.	.70½	.71	.70½	.71	...	.70½
Alcohol, Amyl (from Pentane) tks, delv	lb.	...	.131	...	.131	...	.141
Butyl, normal, syn, tks	lb.	...	.10¾	...	.10¾	.10¾	.14¼
Denatured, CD 14, c-l drs	gal. *d*	...	.57	...	.57	...	.54½
Denatured, SD, No. 1, tks.*d*		...	.50	...	.50	...	.50
Ethyl, 190 proof tks	gal.	...	17.60	...	17.60	...	11.90
Isobutyl, ref'd, drs	lb.	...	.086	...	.086	...	.086
Isopropyl ref'd, 91%, dms	gal.	.38	.41	.37½	.66½	.39	.66½
Alum, ammonia, lump, bbls, wks	100 lb.	...	4.25	...	4.25	...	4.25
Aluminum, 98-99%	100 lb.	15.00	16.00	15.00	16.00	15.00	16.00
Chloride anhyd l.c.l. wks	lb.	.09	.12	.08	.12	.08	.12
Hydrate, light, bgs.	lb.	...	.14½	...	.14½	.14½	.15
Sulfate, com'l. bgs, wks, c-l	100 lb.	1.15	1.25	1.15	1.25	1.15	1.25
Sulfate, iron-free, bgs, wks	100 lb.	1.75	2.00	1.85	2.50	1.75	2.50
Ammonia anhyd, cyl	lb.	...	.14½	...	.14½	...	.16
Ammonium Carbonate, USP, lumps, dms	lb.	.08¼	.09¼	.08½	.09¼	.08¼	.09¼
Chloride,whi,bbls,wks,100	lb.	4.45	5.15	4.45	5.15	4.45	5.15
Nitrate, tech. bags, wks.	lb.	.0435	.0450	.0435	.0850	.0435	.0850
Oxalate pure, grn. bbls.	lb.	...	.23	.27	.33	.27	.33
Perchlorate, kgs	lb.	No stocks		.55	.65	.55	.65
Phosphate, dibasic tech. bgs	lb.	.07	.07¾	.07	.07¾	.07¼	.08½
Stearate, anhyd. dms.	lb.	...	.34	...	.34	...	.34
Sulfate, dms, bulk	ton	28.20	29.20	28.20	29.20	28.20	30.00
Amyl Acetate (from pentane) c-l, drs, delv	lb.	...	.15½	...	.15½	...	.15½
Aniline Oil, drs	lb.	.11½	.12½	.11½	.12½	.11½	.12½
Anthraquinone, sub, bbls.	lb.	...	.70	...	.70	...	.70
Antimony Oxide, bgs	lb.	.15	.16	.15	.15½	.15	.15½
Arsenic, whi, kgs—powd.	lb.	.04	.04¼	.04	.04¾	.04	.04¾

USP $25 higher; Prices are f.o.b. N. Y., Chicago, St. Louis, deliveries ½c higher than NYC prices; y Price given is per gal; c Yellow grades 25c per 100 lbs less in each case; *d* Prices given are Eastern schedule. *a* Powdered boric acid $5 a ton higher; *b* Powdered citric acid is ½c higher.

	Current Low	Current High	1944 Low	1944 High	1943 Low	1943 High
Barium Carbonate precip, wks, bgs. ton	60.00	75.00	55.00	75.00	55.00	65.00
Chloride, tech, cyst, bgs, zone 1 ton	73.00	78.00	73.00	90.00	77.00	90.00
Barytes, floated, bbls. ton	...	36.00	...	36.00	...	36.00
Bauxite, bulk mines ton	7.00	10.00	7.00	10.00	7.00	10.00
Benzaldehyde,tech,cbys,dms lb.	.45	.55	.45	.55	.45	.55
Benzene (Benzol), 90%, tks, ft all'd gal.	...	.15	...	.15	...	.15
Benzyl Chloride, cbys lb.	.22	.24	.22	.28	.22	.25
Beta-Naphthol, tech, bbls, wks ton	.23	.24	.23	.24	.23	.24
Bismuth metal, ton lots lb.	...	1.25	...	1.25	...	1.25
Blanc Fixe, 66⅔% Pulp, bbls, wks ton	40.00	46.50	40.00	46.50	40.00	46.50
Bleaching Powder, wks,100 lb.	2.50	3.60	2.50	3.60	2.50	3.60
Borax, tech, c-l, bgs ton	...	45.00	...	45.00	...	45.00
Bordeaux Mixture, drs lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases lb.	.21	.23	.21	.30	.25	.30
Butyl, acetate, norm. drs. lb.	.1860	.1910	.1755	.1945	.1575	.1840
Cadmium Metal lb.	.90	.95	.90	.95	.90	.95
Calcium, Acetate, bgs, 100 lb.	3.00	4.00	3.00	4.00	3.00	4.00
Carbide, drs ton	50.00	90.00	50.00	95.00	50.00	95.00
Carbonate, c-l bgs ton	18.00	22.00	18.00	22.00	18.00	22.00
Chloride, flake, bgs c-l ton	18.50	35.00	18.50	35.00	18.50	35.00
Solid, 73-75% drs, c-l, ton	18.00	34.50	18.00	34.50	18.00	31.50
Gluconate, U.S.P., drs. lb.	.57	.59	.57	.59	.57	.58
Phosphate, tri, bbls, cl. lb.	...	.0635	.0635	.0785	.0635	.0785
Camphor, U.S.P., gran, powd, bbls lb.	.69	.71	.68½	.71	.68½	.70½
Carbon Bisulfide, 55-gal drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Dioxide, cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, Zone 1, 52½ gal. drms lb.	.73	.80	.73	.80	.73	.80
Casein, Acid Precip, bgs, 100 or more lb.	.24	.24¼	...	.24	...	.24
Chlorine, cyls, lcl, wks, contract lb.	...	.07¼	...	.07¼	...	.07¼
cyls, c-l, contract lb. *j*	...	.05¼	...	.05¼	...	.05¼
Liq, tk, wks, contract 100 lb.	...	1.75	...	1.75	...	1.75
Chloroform, tech, drs lb.	.20	.25	.20	.23	.20	.23
Coal tar, bbls, crude bbl.	8.25	8.75	8.25	8.75	8.25	8.75
Cobalt, Acetate, bbl lb.	...	.83¾	...	.83¾	...	.83¾
Oxide, black kgs lb.	...	1.84	...	1.84	...	1.84
Copper, metal 100 lb.	12.00	12.50	12.00	12.50	12.00	12.50
Carbonate, 52-54%, bbls. lb.	.19½	.20½	.19½	.20½	.19½	.20½
Sulfate, bgs, wks cryst. 100 lb.	5.00	5.50	5.00	5.50	5.00	5.50
Copperas, bulk, c-l, wks ton	...	14.00	...	14.00	...	14.00
Cresol, USP, drs lb.	.10¾	.11¾	.10¾	.11¾	.10¾	.11¾
Cyanamid, bgs ton	1.52½	1.62½	1.52½	1.62½	1.52½	1.62½
Dibutylamine, c-l, drs, wks,	...	.66	...	.66	...	.66
Dibutylphthalate, drs lb.	.1770	.2359	.1780	.2659	.2060	.2300
Diethylaniline, lb drs lb.	...	.40	...	.40	...	.40
Diethyleneglycol, drs, wks lb.	.14	.15	.14	.15½	.14	.15½
Dimethylaniline, dms,cl.,lcl lb.	.21	.22	.21	.24	.23	.24
Dimethyl phthalate, drs lb.	.1875	.1925	.1875	.1925	.1875	.2050
Dinitrobenzene, bbls lb.	...	.18	...	.18	...	.18
Dinitrochlorobenzene, dms lb.	...	.14	...	.14	...	.14
Dinitrophenol, bbls lb.	...	.22	...	.22	...	.22
Dinitrotoluene, dms lb.	...	.18	...	.18	...	.18
Diphenyl, bbls lcl. wks lb.	.16	.20	.16	.20	.15	.20
Diphenylamine bbls lb.	...	.25	...	.25	...	.25
Diphenylguanidine, drs lb.	.35	.37	...	.35	.35	.37
Ethyl Acetate, tks, frt all'd lb.	.0975	.1175	.1070	.1175	.107	.110
Chloride, drs lb.	.18	.20	.18	.20	.18	.20
Ethylene Dichloride, lcl. wks, E. Rockies, dms lb.	.0842	.0941	.0842	.0941	...	.0842
Glycol, dms, cl. lb.	...	.10	...	.10	...	.10
Fluorspar, No. 1, grd.95-98% bulk, cl-mines ton	...	37.00	...	37.00	...	37.00
Formaldehyde, bbls, cl & lcl lb.	.0520	.0570	.0520	.0570	.0550	.0575
Furfural tech, dms, c-l,wks lb.	...	.13	...	.13	...	.12½
Fusel Oil, ref'd, dms, dlvd lb.	.18½	.19½	.18½	.19½	.18½	.19½
Glauber's Salt, Cryst, c-l, bgs, bbls, wks 100 lb.	1.05	1.45	1.05	1.25	1.05	1.25
Glycerin dynamite, dms, c-l, lb.	...	16½	...	.14½	...	.18¾
Crude Saponification, 80% to refiners tks lbs.	...	.11½	.09⅛	.10	...	.12¾

GUMS

Gum Arabic, amber sorts bgs lb.	.11½	.12	.11¾	.14	.13½	.17½
Benzoin Sumatra, CS lb.	.52	1.00	.52	1.00	.52	1.00
Copal, Congo lb.	...	.55¾	...	.55¾	...	.55¾
Copal, East India, chips lb.	...	.53⅛	...	...	...	...
Macassar dust lb.	...	.07¾	...	.07¾	.07¾	.11¾
Copal Manila,	.13½	.15½	.13½	.15½	.13½	.15½
Copal Pontianak, bold c-l lb.	...	.23¾	...	.23¾	...	.23¾
Karaya, bbls, bxs, dms. lb.	.18	.46	.15	.46	.14	.40

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; rened, ref'd; tanks, tks; works, f.o.b., wks.
y Price given is per gal.

Current Prices

Gums
Salt Cake

		Current Low	Current High	1944 Low	1944 High	1943 Low	1943 High
Kauri, N. Y.							
Superior Pale XXX	lb.	...	.65¾	...	.65¾	...	.65¾
No. 3	lb.	...	.22	...	.23	...	.22
Sandarac, cs	lb.	...	.99½	...	.99½	1.40	nom.
Tragacanth, No. 1, cases	lb.	3.80	3.90	4.00	5.25	4.00	5.25
No. 3	lb.	2.15	2.60	1.10	3.50	1.10	1.20
Yacca, bgs	lb.	.06	.07¼	.06	.07¼	.06	.07¼
Hydrogen Peroxide, cbys	lb	.15½	.18½	.15½	.18½	.15½	.18½
Iodine, Resublimed, jars	lb	1.75	1.85	2.00	2.10	2.00	2.10
Lead Acetate, cryst, bbls.	lb.	...	.12½	...	.12½	...	.12½
Arsenate basic, bg, lcl	lb.	.11½	.12	.11½	.12	.11½	.12
Nitrate, bbls.	lb.	...	.12½	...	.12½	...	.12
Red, dry, 95% Pb_3O_4 bbls.	lb.	.09	.10¾	.09	.11	.09	.11
97% Pb_3O_4, bbls delv	lb.	.09½	.11	.09¼	.11	.09¼	.11
98% Pb_3O_4, bbls delv	lb	.09½	.11¼	.09½	.11¼	.09½	.11¼
White, bbls	lb.	.08¼	.08¾	.08¼	.08¾	.08¼	.08¾
Basic sulfate, bbls, lcl	lb.	.07¼	.08	.07¼	.08	.07¼	.08
Lime, Chem., wks, bulk	ton	6.50	9.25	6.25	13.00	6.25	13.00
Hydrated, f.o.b. wks	ton	8.50	.12	8.50	16.00	8.50	16.00
Litharge, coml, delv. bbls	lb.	.08	.09¾	.08	.09¾	.08	.09¾
Lithopone, ordi., bgs	lb.	.04¼	.04½	.04¼	.04¾	.04¼	.04¾
Magnesium Carb, tech, wks	lb.	.07¼	.10¾	.06¼	.09¾	.06¼	.09½
Chloride flake, bbls, wks c-l	ton	...	32.00	...	32.00	...	32.00
Manganese, Chloride, Anhyd. bbls	lb.	.15	.18	.15	.18	.14	nom.
Dioxide, Caucasian bgs, lcl	ton	74.75	79.75	...	74.75	...	74.75
Methanol, pure, nat, drs gal	*l*	.63	.73	.63	.76	.63	.76
Synth, drs cl gal.	*m*	.31	.38	.31	.40½	.34½	.40½
Methyl Acetate, tech tks	lb.	.06	.07	.06	.07	.06	.07
C.P. 97-99%, tks, delv	lb.	.09½	.10½	.09½	.10½	.09½	.10½
Chloride, cyl	lb.	.32	.40	.32	.40	.31	.40
Ethyl Ketone, tks, frt all'd	lb.	...	.08	...	.08	...	.08
Naphtha, Solvent, tks	gal.	...	.27	...	.27	...	.27
Naphthalene, crude, 74°, wks tks	lb.		.0275		.0275		.0275
Nickel Salt, bbls, NY	lb.	.13	.13½	.13	.13½	.13	.13½
Nitre Cake, blk	ton		16.00		16.00		16.00
Nitrobenzene, drs, wks	lb.	.08	.09	.08	.09	.08	.09
Orthoanisidine, bbls	lb.	...	.70	...	.70	...	.70
Orthochlorophenol, drs	lb.	.25	.27	.25	.32	...	.32
Orthodichlorobenzene, drms	lb.	.07	.08	.07	.08	.07	.08
Orthonitrochlorobenzene, wks	lb.	.15	.18	.15	.18	.15	.18
Orthonitrotoluene, wks, dms	lb.	...	.09	...	.09	...	.09
Paraldehyde, 98%, wks lcl.	lb.	...	.12	...	.12	...	.12
Chlorophenol, drs.	lb.	.26½	.28	.25	.32	...	.32
Dichlorobenzene, wks	lb.	.11	.15	.11	.15	.11	.15
Formaldehyde, drs, wks	lb.	.21	.22	.23	.24	.23	.24
Nitroaniline, wks, kgs	lb.	.43	.45	.43	.45	.43	.45
Nitrochlorobenzene, wks	lb.	...	.15	...	.15	...	.15
Toluenesulfonamide, bbls	lb.	...	.70	...	.70	...	.70
Toluidine, bls, wks	lb.	...	.48	...	.48	...	.48
Penicillin, ampules per 100,000 units		.59	.95	.95	4.50	...	...
Pentaerythritol, tech	lb.	.27	.31	.29	.33	.29	.35½

PETROLEUM SOLVENTS AND DILUENTS

Lacquer diluents, tks, East Coast	gal.	...	.11½	...	.11½	...	.11
Naphtha, V.M.P., East tks, wks	gal.	...	.11	...	.11	...	.11
Rubber solvents, East, tks, wks	gal.	...	.11	...	.11	...	.11
Stoddard Solvents, East, tks, wks	gal.	...	.10	...	.10	...	.09½
Phenol, U.S.P., drs	lb.	.10½	.11¼	.10½	.11¼	.10½	.13¾
Phthalic Anhydride, cl and lcl, wks	lb.	.13	.14	.13	.14	.13	.15½
Potash, Caustics, 88-92%, wks, sol.	lb.	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾
flake, 88-92%	lb.	.07	.07½	.07	.07½	.07	.07½
liquid, 45% basis, tks	lb.	...	.02⅞	...	.02¾	...	.0275
dms, wks	lb.	.03⅛	.03½	.03	.03½	.03	.03½
Carbonate, hydrated 83-85%	lb.	...	.05½	.05½	.05¾	.05½	.05¾
Chlorate crys, bgs, wks	lb.	.11	.13	.11	.13	.11	.13
Chloride, crys, tech, bgs, kgs	lb.	.08	nom.	.08	nom.	.08	nom.
Cyanide, drs, wks	lb.	...	.55	...	.55	...	.55
Iodide, bots., or cans	lb.	1.44	1.48	1.44	1.48	1.44	1.48
Muriate, dom, 60-62-63% K_2O bulk unit-ton	ton	...	.53½	...	.53½	.53½	.56
Permanganate, USP, wks dms	lb.	.20½	.21	.20½	.21	.20½	.21
Sulfate, 90%, basis, bgs	ton	...	36.25	...	36.25	...	36.25
Propane, group 3, tks	gal.	...	.03¾	...	.03¾	...	.03¾
Pyridine, ref., drms	lb.	.45	.45½	.45	.46	.45½	.46
R Salt, 250 lb bbls, wks	lb.	...	.65	...	.65	...	.65
Resorcinol, tech, drms, wks	lb.	.64	.74	.68	.75	.68	.75
Rochelle Salt, cryst	lb.	.43½	.47	.43½	.47	.43½	.47
Salt Cake, dom, blk wks	ton	...	15.00	...	15.00	...	15.00

l Producers of natural methanol divided into two groups and prices vary for these two divisions; *m* Country is divided in 4 zones, prices varying by zone.

* Spot price is ½c higher.

		Current Low	Current High	1944 Low	1944 High	1943 Low	1943 High
Saltpetre, grn, bbls	100 lb.	8.20	8.60	8.20	8.60	8.20	8.60
Shellac, Bone dry, bbls	lb. r	.42½	.46	.42½	.46	.42½	.46
Silver Nitrate, 100 oz, bots 2,500-oz. lots	oz.	.47	.47¾	...	.32⅜	...	.32⅜
Soda Ash, 58% dense, bgs, c-l, wks	100 lb.	...	1.15	...	1.15	...	1.15
58% light, bgs cl	100 lb.	1.05	1.13	1.05	1.13	...	1.13
Caustic, 76% flake drms, cl	100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drms,cl	100 lb.	...	2.30	...	2.30	...	2.30
Liquid, 47-49%, sellers, tks	100 lb.	...	1.95	...	1.95	...	1.95
Sodium Acetate, anhyd. dms	lb.	.08½	.10	.05	.10	.05	.06
Benzoate, USP dms	lb.	.46	.52	.46	.52	.46	.52
Bicarb, tech., bgs., cl., works	100 lb.	1.55	1.90	1.55	2.05	...	...
Bichromate, bgs,wks l.c.l.	lb.	.07⅞	.08⅛	.07⅞	.08⅛	...	.07¾
Bisulfite powd, bbls, wks	100 lb.	3.00	3.60	3.00	3.60	3.00	3.60
35° bbls., wks	100 lb.	1.40	1.65	1.40	1.65	1.40	1.65
Chlorate, kgs, wks c.l.	lb.	...	.06¼	...	.06¼	...	.06¼
Cyanide, 96-98%, wks	lb.	.14½	.15	.14½	.15	.14½	.15
Fluoride, 95%, bbls, wks	lb.	.07¼	.08¼	.07¼	.08¼	.07¼	.08¼
Hyposulfite, cryst, bgs, cl, wks	100 lb.	...	2.25	...	2.25	...	2.25
Metasilicate, gran, bbl, wks c-l	lb.	...	2.50	...	2.50	...	2.50
Nitrate, imp, bgs	ton	...	33.00	...	33.00	...	33.00
Nitrite, 96-98% bbl. cl.	lb.	...	.06¾	...	.06¾	...	.06¾
Phosphate, di anhyd. bgs. wks.	100 lb.	6.00	6.75	6.00	7.25	6.00	7.25
Tri-bgs, cryst, wks	100 lb.	2.70	3.10	2.70	3.40	2.70	3.45
Prussiate, yel, bbls. wks	lb.	...	.11	.10	.11	.10	.11
Silicate, 52°,drs,wks	100 lb.	1.40	1.80	1.40	1.80	1.40	1.80
40°, drs, wks, c-l	100 lb.	...	.80	...	.80	...	.80
Silicofluoride, bbls NY	lb.	.06½	.10	.06½	.12	.05	.12
Sulfate tech. Anhyd. bgs	100 lb.	1.70	2.20	1.70	1.90	1.70	1.90
Sulfide, cryst c-l, bbls, wks	100 lb.	...	2.40	...	2.40	...	2.40
Solid, bbls, wks	lb.	3.15	3.90	3.15	3.90	3.15	3.90
Starch, Corn, Pearl, bgs	100 lb.	...	4.08	...	4.08	...	3.47
Potato, bgs, cl	lb.	...	.0637	...	.0637	...	.0637
Rice, bgs	lb.	no stocks		no stocks		.09½	.10¼
Sweet Potato, bgs	lb.	no stocks		.07½	.09¼	...	.07½
Sulfur, crude, mines	ton	...	16.00	...	16.00	...	16.00
Flour, USP, precp, bbls, kgs	lb.	.18	.30	.18	.30	.18	.30
Roll, bbls	100 lb.	2.40	2.90	2.40	2.90	2.40	2.90
Sulfur Dioxide, liquid, cyl	lb.	.07	.08¼	.07	.09	.07	.08
tks, wks	lb.	...	.04	.04	.06	.04	.06
Talc, crude, c-l, NY	ton	...	13.00	...	13.00	...	13.00
Ref'd, c-l, NY	ton	13.00	21.00	13.00	21.00	13.00	21.00
Tin, crystals, bbls, wks	lb.	no stocks		no stocks		no stocks	
Metal	lb.	...	.52	...	.52	...	.52
Toluol, drs, wks	gal.	...	.32	...	.34½	...	.33
tks, frt all'd	gal.	...	.27	...	.28	...	.28
Tributyl Phosphate, dms lcl, frt all'd	lb.	...	.49	...	.49	...	.47
Trichloroethylene, dms, wks	lb.	.08	.09	.08	.09	.08	.09
Tricresyl phosphate tks.	lb.	...	.24	...	.24	...	...
Triethylene glycol, dms	lb.	.18½	.19½	.18½	.26	...	.26
Triphenyl Phos, bbls	lb.	.26	.27½	.31	.32	.31	.32
Urea, pure, cases	lb.	...	.12	...	.12	...	.12
Wax, Bayberry, bgs	lb.	no stocks		.25	nom.	.25	.26
Bees, bleached, cakes	lb.	...	.60	...	.60	...	.60
Candelilla, bgs crude	ton	.38	.41	.34½	.48	.38	.48
Carnauba, No. 1, yellow, bgs, ton	lb.	...	.83¼	...	.83¼	...	.83¼
Xylol, Indus. frt all'd, tks, wks	gal.	...	.26	...	.27	...	.27
Zinc Chloride tech fused, wks	lb.	.05	.0535	.05	.0535	.05	.0535
Oxide, Amer, bgs, wks	lb.	.07¼	.07½	.07	.07½	.07	.07½
Sulfate, crys, bgs	100 lb.	3.40	4.15	3.40	4.35	3.60	4.35

OILS AND FATS

Babassu, tks, futures	lb.	...	.111	...	.111	...	.111
Castor, No. 3, bbls	lb.	.13¾	.14¼	.13¾	.14¼	.13¾	.14¼
China Wood, drs, spot NY	lb.	.39	.41	.39	.41	...	.39
Coconut, edible, drs NY	lb.	...	.0985	...	.0985	...	.0985
Cod Newfoundland, dms	gal.	.85	.88	.85	.90	...	.90
Corn, crude, tks, wks	lb.	...	.12¾	...	.12¾	...	.12¾
Linseed, Raw, dms, c-l	lb.	...	.1550	.1510	.1560	...	.1530
Menhaden, tks		...	.1225	...	.1225	...	.1225
Light, pressed, drs l.c.l.	lb.	...	.1300	...	.1200	.1305	.1307
Palm, Niger, dms	lb.	...	.0865	...	.0865	...	.0865
Peanut, crude, tks, f.o.b. wks	lb.	.12⅞	.13⅛	.12⅞	.13⅛	...	.18
Perilla, crude dms, NY	lb.	no stocks		...	.245	...	.245
Rapeseed, New Orleans, bulks	lb.	...	.1156½	...	.1156½	...	.1150
Red, dms	lb.	.13¼	.14¼	.13¼	.14¼	...	
Soy Bean, crude, tks, wks	lb.	...	.1175	...	.1175	...	.1175
Tallow, acidless, bbls	lb.	...	.14¼	...	.14¼	...	.14¼

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b N. Y., refined 6c higher in each case.

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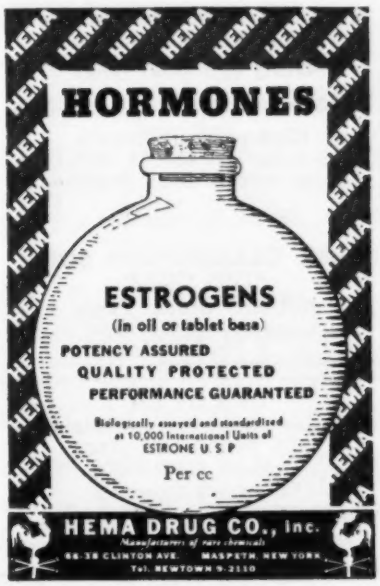

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3—Abbe 90, 175 and 200 gal. Pebble Mills
1—Abbe Jacketed Ball Mill, 50 gal.
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3—Rotex Triple Deck Sifters, 40" x 84", 20" x 80"
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1—125 gal. Aluminum Jktd. Kettle
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5—4' x 24' x 2'6" Deep Stainless Clad Steel, Jacketed—1800 gals.

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6—40" Centrifugal Extractors.
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1—8' dia. x 10' deep, Iron body with heating coil, agitator & drive, 3000 gals.
2—4' dia. x 4'6" deep Iron body, anchor agitator and newport drive, 400 gals.
1—4' dia. x 4' deep Iron body, agitator & drive, 400 gals.
1—3'6" dia. x 5' deep, steel jacketed, lead lined with agitator, 350 gals.
1—4'6" dia. x 3' deep, steel jacketed, with agitator and drive, 350 gals.
1—3'6" dia. x 5' deep cast steel, jacketed, no drive or agitator, 350 gals.

PUMPS

1—Wilfley Model AB Centrifugal—7½ H.P. motor—2" inlet, 1½" discharge.
1—Shriver Diaphragm 3A—lead liquid ends, 90 gals., motor drive.
1—Shriver Diaphragm 3A—Rubber lined, 90 gals., motor chain drive.
4—Vacuum single phase stokes—size 8" x 6", pulley drive.
1—Quimby 4 stage Centrifugal, 500 gals.—75 H.P. G.E. motor.
1—American Well 2 stage Centrifugal, 350 gal. 30 H.P.G.E. motor, Magnetic Starter.
2—Gould Triplex Plunger—size 8" x 10"—400 gals. Pulley Drive.
1—Gould Triplex Plunger—size 3" x 4"—25 gals. V Belt Drive.
1—Quimby Screw Type—size 2"—5 G.P.M.—50' head—motor drive.

ROTARY DRYER OR KILN

1—5' dia. x 40' long Horizontal Rotary Dryer, ½" shell, complete with tires, ring gear, rollers gearing, base plates.

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2—70"x30" Ruggles Coles Direct Heat Rotary Dryers, Type A-9.
9—Direct heat Rotary Dryers, 4'x30', 5'x30', 70"x30', 6'x60'.
1—7'6"x75' Indirect Heat Rotary Dryer.
5—Rotary Kilns, 6'x60', 8'x126', 8'x135'.
1—32"x72" Buflovak Atmospheric Double Drum Dryers, m.d.
1—5'x12' Vacuum Drum Dryer, - Buffalo Foundry complete with accessories.
10—Rotary Vacuum Dryers; 3—Buffalo 5'x20'; 3—Devine 4'x25'; 1—Devine 4'x30'; 1—Struthers Wells 30"x12'.
2—Atmospheric Drum Dryers 4'x12'.
1—Buffalo 32"x90" Atmospheric double drum Dryer, complete m.d.
1—Devine 3'x9' Bronze Double Drum Rotary Vacuum Dryer, complete with all auxiliaries.
1—42"x100" Buflovak Atmo. double drum Dryer, complete m.d.
1—Buffalo 32"x72" Atmospheric double drum Dryer, complete m.d.
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5—Atmospheric TRUCK DRYERS. Each has 4 trucks. Each Truck holds 40 Trays—1280 sq. ft. of tray surface per dryer. Equipped with trays, heating coils, fans, etc.

6—PEBBLE MILLS, 1—6' x 5' Burrstone Lined; 1—32" x 42" Rubber Lined; 4—30 gal. porcelain lined. Other Sizes.
2—18" x 18", 24" x 24", Jeffrey single ROLL CRUSHERS.
5—DRY POWDER MIXERS, various sizes. To 3000 lbs.
6—RAYMOND PULVERIZERS: 4-Roll Low Side; No. 3, No. 1, 0000.
12—OLIVER FILTERS, 4' x 6', 6' x 6', wood and iron; 8' x 8'; 8' x 12'.
1—4' x 6' OLIVER CONTINUOUS FILTER; 2—8' x 8'.
8—HEAT EXCHANGERS, 50 to 1600 sq. ft. heating surfaces; 5 copper, 2 steel tubes.
8—RUBBER LINED Rectangular Tanks: 7—500-gal.; 1—150 gal.
23—CENTRIFUGAL EXTRACTORS, 12" to 72" bronze and steel baskets, belt and motor drives.
1—PNEUM. SCALE CARTON PACKAGING UNIT.
1—Pneumatic Scale Co. Auto tight WRAPPER.
1—36" dia. Cast Iron COLUMN, 23" high.
2—Batteries of two each TYLER HUMMER SCREENS 4' x 5', single deck, other sizes.
1—Devine duplex VACUUM PUMP 16 x 16 x 12.
3—STOKES steam heated WATER STILLS, 5, 10, 100 gal. per hour.
1—Hardinge BALL MILLS, 5' x 22".
3—8' x 30" Hardinge Conical Silex Lined PEBBLE MILLS, also 6' x 36".
1—5' x 13' PEBBLE or TUBE MILL, with open trunions.
10,000 lbs. 2—4" mixed STEEL GRINDING BALLS.
1—500 gal. 5' x 6' BALL MILL.
1—New 5 HP geared head PORTABLE AGITATOR drip proof motor, stainless steel shaft and 2—14" stainless propellers.
1—Abbe Blutergess SIFTERS; 1—No. 2, 1—No. 1.
9—Deep C. I. Jacketed KETTLES, 25 Gal. to 100 gal.; 30—steel, cast iron, jack, up to 2000 gals.
3—ROLLER MILLS, 12 x 30, 16 x 40 water cooled.
1—Shriver Iron FILTER PRESS, 42" x 42", 30 chambers.
3—50 gal. copper steam jacketed VACUUM PANS. Complete; other sizes to 750 gal.
1—Size "B" Erie City COAL PULVERIZER with 40 P 3/60/220-440 V Motor. Rated 2000 lbs. per hour.
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1—Richie friction grease TESTING MACHINE, cap. 10,000 P. S. I.
1—World automatic rotary LABELER m. d.
1—1000 gal. lead-lined closed TANK, lead coils.
1—400 gal. horiz. rubber lined MIXER.
1—All Copper 5' dia. VACUUM PAN with condenser and vac. pump.
1—Karl Kiefer Pisten Viseo Filler, No. 2.
1—500 gal. jack, agit. AUTOCLAVE, steel, hammer welded construction 200 lb. jack, press. 500 lb. internal press.
1—U. S. COLLOID MILL 6" Stainless Steel Rotor. 5 HP AC Motor.
1—Komarek-Greaves BRIQUETTE PRESS, with 2—32" x 24" face, rolls for egg-shaped briquettes, rated 25 tons per hour.
3—Beach-Russ No. 10 ROTARY VACUUM PUMPS with V-belt Drive m.d.
1—Pneumatic Scale straight line BOTTLE CLEANER.
3—150 gal. aluminum TANKS cone bottom.
1—Stokes No. 21 GRANULATING MIXER 50 lb. belt driven.

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2—4-Roll Raymond High Side Mills, equipped for vacuum air separation—one with latest "whizzer" separator, one with double cone vacuum separator. Each including exhauster, cyclone collector and inter-connecting-piping.

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3—Bucket Elevators steel enclosed—78', 45', 35' c-c. including smaller elevators, screw conveyors, etc.

2—No. 0 Raymond Beater type Pulverizers, each equipped with air classifier, exhauster, cyclone collector, tubular dust collector and inter-connecting piping.

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3—60-440 volt Motors and Starting Equipment will be included with all of the above machines. All other bucket elevators, screw conveyors, etc. included.

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2—Jones Automatic CARTONERS.
2—Anderson PACKAGING UNITS.
1—2,500 lb. Horizontal Steel Dry POWDER MIXER, spiral agitator.
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1—U. S. Bottlers 22-spout Rotary Vac. Bottle Filler complete m.d.
3—Sharpless No. 6 Clarifiers and Separators, m.d.
4—DeLaval Clarifiers and Separators, m.d.
1—Swenson 750 sq. ft. triple effect Evaporator and Finishing Pan, complete.
1—York 4" x 4" Ammonia Compressor.
1—Portable Revolvator 1000 lb., 1' height, M.D.
1—Doig 4-track Nailing Machine, m.d.
1—F. J. Stokes auger Powder Filler.
1—McClellan Dry Powder Tumbling Mixer.
1—J. H. Day Size 10 Jack. Imperial Mixer, 30 gal.

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12—ANDERSON #1 Expellers with A.C. Motors and Starters.

1—CUTLER #4 Steam Tube Dryer.

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2—Sprout Waldron 22" Attrition Mills
30—Steel Tanks, 800 to 10,000 Gal. Cap.
1—A. O. Smith Stainless Steel Condenser
2—100# Powder Mixers.
1—Pfaudler 25 Gal. Vacuum Still
2—2000 GPM 8" Centrifugal Pumps
1—Copper Steam Jacketed Still Pot, 5500 Gal. Cap.
1—100# J. H. Day Heavy Duty Mixer
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5' x 33' Steam Jacketed Vacuum Dryer
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18 x 36 & 42 x 10 Acme Jaw Crushers
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1—Raymond 5-roll high side Pulverizer.
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1—24" Mikro Pulverizer—belt drive.
2—#600 De Laval Clarifiers.
5—3-roll Mills: 16x40 and 12x30".
1—36" Johnson 42-plate rec. Filter Press.
2—4 x 6' Atmospheric Drum Dryers.
4—Lead-lined Tanks, 400 and 1000-gal.
1—#5 Sweetland Filter.
2—Oliver Filters: 5x4' and 6x4'.
1—Union 10x20x12" Dry Vacuum Pump.
1—3' Copper Vacuum Pan.
4—Water Stills: 10 and 25 GPH.
3—10-cup International Centrifuges.
1—10 gal. Bufflovac jac. Autoclave.
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675 KVA Genl. Elect. Generator—150 RPM, 3/60/440 Volts—811 Amps. Direct connected to:

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6x15x10 Allis Chalmers Dry Vacuum Pump.

Tirrell Voltage Regulator Type TA 125 Form A2

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Long established corporation in western New York having line of nationally known products has opening in Research Lab for Chemist or Chemical Engineer. Knowledge and experience in paper processing as well as printing methods, inks and paper handling equipment especially desirable. State education, experience, age, salary and availability. Box No. 2063, Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

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Practical minded Ph.D. for medium sized well-known manufacturer of organic chemicals. To have sole charge of up to ten chemists engaged in product improvement, customer problems and new product development. Location New York City. Box 2068. Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

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HELP WANTED: Have you had practical experience in the commercial manufacture of Vinyl Chloride from acetylene or in the polymerization of Vinyl Chloride? If so, have a very interesting opportunity for you with excellent Post War opportunities. Write us, giving details of your training and experience. Replies held confidential. Address **Box 2049,** Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

CHEMIST. Research and Production work on Pigments. Permanent position with future. Five day week. Give full details regarding self in first reply. **Box 2050,** Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

CHEMICAL ASSISTANT. Mostly for research work. Laboratory experience necessary. Five-day week. Staten Island location. **Box 2051,** Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

PHYSICAL CHEMIST, Ph. D., for catalyst research, largely industrial organic reactions involving Group VIII elements. Both fundamental and practical work contemplated. Opportunities afforded for outside contacts and publications. Box 2067, Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

SALESMEN: Large manufacturer Sanitary Chemicals, selling to distributors has opening for experienced men. Good opportunities in established territories. Must be capable of earning in excess $5,000. State experience and references in first letter. Box 2070, Chemical Industries, 522 Fifth Avenue, New York 18, N. Y.

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(FOR EMPLOYMENT INFORMATION SEE "HELP WANTED")

INDUSTRIAL EXECUTIVE

Does your organization need an experienced executive of wide vision, a man of ability and integrity with 15 years in chemical industry as Sales Mgr., Gen. Mgr. and Exec. Vice-Pres.; a coordinator; a sales promotion and market research analyst;—a graduate chemical engineer with Harvard Business School training? Now employed but looking for a larger opportunity.

BOX No. 2073
Chemical Industries, 522 Fifth Ave.
New York 18, N. Y.

CHEMICAL ENGINEER—Five years experience—development engineering including design and supervision of pilot scale equipment, process engineering including testing of plant units. Background, personality, and interests suitable for technical sales or marketing service. Position working with new processes or products desired. Age 28—Single. Northeastern United States preferred. Box 2071, Chemical Industries, 522 Fifth Avenue, New York 18, N. Y.

EXPORT EXECUTIVE—thoroughly experienced chemicals, initiative, aggressive, fluent linguist, 40 yrs., prepared to travel extensively, would assume responsibility, build large volume foreign trade. Box 2064, Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

BUSINESS OPPORTUNITIES

EXPORT TO SWEDEN

A business friend of ours residing in Sweden desires sales agency for chemicals, particularly floor wax, soaps, disinfectants and similar items. Interested American manufacturers will please communicate with Fred Mann & Co., 545 Fifth Avenue, New York 17, N. Y.

CHEMICALS

Netherlands firm is still open for some sole agencies for manufactories of Chemical Products suitable for export to the Netherlands. Letters to the office of this magazine, Box 2066.

MANUFACTURERS' AGENT

University graduate, chemistry major, opening office, wants to handle rubber and industrial chemicals in Ohio area. 20 years sales and sales management experience in rubber industry, thorough understanding of production, research and sales; aggressive, intelligent solicitation guaranteed. Box 2056 Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

CITRIC ACID

Scandinavian firm desires contact United States citric acid manufacturers for license to produce fermented citric acid in Scandinavia. Reply to Box No. 7052, Sylvester Hvid, Frederiksberggade 21, Copenhagen, K.

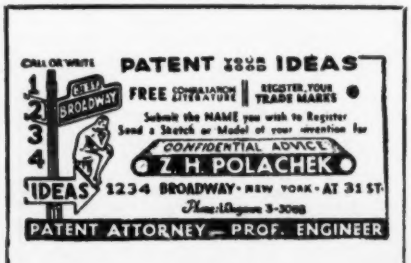
INSECTICIDES

Firm, specialized in the sale of all kinds of INSECTICIDES and DISINFECTANTS, seeks sole agency for the Netherlands of American manufactory, preferably of novelties. Letters to the office of this magazine, Box 2065.

SALES REPRESENTATION—Ohio licensed chemical engineer, after three years in War Production Board, is returning to Cincinnati to open a resident selling office. Excellent coverage of area assured aggressive manufacturers desiring or requiring chemical knowledge to present, sell and service their products. Will accept nonconflicting lines only. All inquiries answered in confidence. Box 2062, Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

MEXICO—Mexico's leading chemical manufacturer now visiting U. S. wishes to make connection with American agricultural chemical manufacturer, interested Mexico's market. Box 2061, Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

PATENTS



Kraus Represents Smith Chemical & Color

Mr. William Kraus is now eastern field representative for Smith Chemical & Color Co., Inc., Brooklyn, New York, manufacturers, exporters and importers of dry colors and chemical specialties.

Recently, Mr. Kraus was honorably discharged from the U. S. Army after more than three years of active service. For ten years prior to his military enlistment, Mr. Kraus was engaged in the pigment and chemical business.

Gillam on Staff of Midwest Institute

Dr. W. S. Gillam, professor of agricultural chemistry at Purdue University, has joined the staff of the Midwest Research Institute, Kansas City, where he will specialize in research in soils, plant nutrition and analytical services. He was formerly on the faculty of Michigan State College, Nebraska Wesleyan University and University of Nebraska.

Miller Manages Diaperwite, Leaves OPA

Harry H. Miller, former chief of chemical and chemical products branch of OPA, has been named general manager of Diaperwite Co.

McDonald Joins Calo Sales Staff

Philip E. Calo Company, Chicago, Illinois, manufacturer's representative and dealers of industrial chemicals, naval stores, oils, resins and waxes, has announced the appointment of O. M. McDonald to its sales staff.

Mr. McDonald was formerly associated with the American Paint Company, Chicago.

General Aniline Advances Bain

William A. Bain, Jr., has been appointed head of the engineering department of the Easton, Pa., central research laboratory of General Aniline & Film Corporation, it has been announced by William E. Hanford, director of research for the company.

Dr. Bain will assist the technical staff at the laboratory in solving their engineering problems and will direct the designing of new apparatus, equipment and alternatives as requested. He has been with General Aniline & Film Corporation since June, 1943, after graduating from the University of Wisconsin.

GEORGE J. WIESNER, formerly in charge of the sales department, Golwynne Chemicals Corporation, has organized the George J. Wiesner Company with offices at 52 William Street, New York, where he will carry on an export, import, and domestic business in a general line of chemicals and closely related items.

JOHN H. WALKUP, who for the past three years has been engaged in research for the Pennsylvania Salt Manufacturing Company, Philadelphia, Pennsylvania, has joined the faculty of Centre College, Danville, Kentucky, as assistant professor of Chemistry.

W. W. GARNER, well known for his researches on the tobacco crop, has retired after 40 years in the service of the United States Department of Agriculture.

WILBUR R. WYCKOFF has joined the research and technical division of the Joseph Dixon Crucible Co. as a ceramic engineer. He was formerly with the Washington Brick Co.

TURNER ALFREY, research chemist of the Monsanto Chemical Company of Springfield, Massachusetts, has joined the staff of the Highpolymer Research Bureau of the Department of Chemistry at the Polytechnic Institute of Brooklyn to teach specialized courses in polymer chemistry and to engage in fundamental research in this field.

LEO SPERBER has been named representative in New York for Smith Chemical & Color Co., Inc., Brooklyn.

DOUGLAS WESTIN, formerly employed by the Columbia Carbon Co. has joined the technical sales force of the Barrett Division of Allied Chemical & Dye Corp.

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INDEX *of* ADVERTISERS

"WE" – EDITORIALLY SPEAKING

CHEMISTRY has reared its lovely head in the OPA. We understand that they're putting chemical kits in meat markets to detect counterfeit red points. The otherwise able counterfeiters can't quite cope with the watermark in the genuine stamps.

WE READ something recently that frightened us. We pictured ourselves sitting on the throne of authority, handing down pronouncements of great wisdom —or at least that was our fatuous belief. Now we hear, via Dr. Kettering, of an eminent scientist and teacher who bade farewell to his graduating class as follows:

"You have been a good class. I have given you the best instruction I could. I have told you the best books to read. Now I want to tell you something to remember. I am afraid about half of what I have taught you isn't so.—But that doesn't worry me so much. What concerns me is that I don't know which half it is that is wrong."

BUT OUR confidence in our omniscience —or rather, our reputation for it—was restored by an incident last month. Someone called us on the 'phone to ask us where and how waxes are used. Who was the caller? Only one of the large producers of petroleum waxes!

WE LIKE ONE newspaper writer's comment on the hidden lore brought back here from Germany's chemical industry. He suspects that it is mostly a typical German tome which might well be entitled, *"Handbuch für Getting Along Without a Petroleum Industry."*

THE RECENT INTEREST in silicones and other silicon analogues of organic carbon compounds lends added interest to the paper on "Experimental Researches on the Production of Silicon from Paracyanogen," which was read to the Royal Society of Edinburgh by Dr. Samuel Morison Brown in 1841. The transmutation was not supported by later attempts to duplicate his results, and the blow to his reputation was undoubtedly a factor in his failure to be appointed to the Chair of Chemistry at Edinburgh University.

He was very confident at the time of his report, saying, "I now venture to announce, as the results of my inquiries, that carbon and silicon are isomeric bodies, and that the former element may be converted into a substance presenting all the properties of the latter."

THE COMIC-STRIP characters are returning from the wars. Quietly folding their black capes and silently stealing away are the secret Nazi agents and the sinister saboteurs. Again donning mufti are the beribboned and bemedaled heroes and their ubiquitious, always beautiful, always very blonde or very brunette WAC or WAVE girl friends.

What are they going to do now? What high adventure will lead them on, like the Holy Grail, to dazzling deeds of derring-do? What noble impulse—now that the Jerry and the Nip have been laid low—will evoke moments of reckless courage and utterances of lustrous wisdom?

Harold Teen has made us his mind, and his commendable decision will point the way for those who follow. He is going back to school. To dance?—to sing?—to go to house parties as of yore?—nay, say not so. Following the gleam of shiny laboratory apparatus, he is going to learn all about metals and plastics "to better prepare . . . for the many and sober problems ahead."

THOSE WHO are concerned with national defense might refer to the good Samuel Pepys. Way back in 1663, on November 11, he wrote in his diary, "Dribble the German Doctor, do offer an instrument to sink ships; he tells me that which is more strange, that something made of gold, which they call in chymistry *Aurum fulminans*, a grain, I think he said, of it put in a silver spoon and fired, will give a blow like a musquett, and strike a hole through the spoon downward, without the least force upward; and this he can make a cheaper experiment of, he says, with iron prepared."

THAT POWDERED ORANGES are now in pilot-plant production and may soon appear commercially is a sobering fact we ran across lately. We, who like our orange juice, scrambled eggs, toast, and coffee in the morning, shudder at the thought of eating a couple of teaspoonfuls of a scientifically balanced mixture of powdered oranges, powdered eggs, toast crumbs, and soluble coffee.

Fifteen Years Ago

From Our Files of Nov., 1930

Arthur D. Little, chemical engineer and president, Arthur D. Little, Inc., is awarded Perkin medal for 1931 by the Society of Chemical Industry. He is a member of the board of consulting editors for CHEMICAL MARKETS.

Herbert H. Dow, internationally known chemist and president, Dow Chemical Co., dies at Rochester, Minn., October 15, aged 64. Willard H. Dow, his son, who has been assistant general manager and assistant treasurer, succeeds to the presidency.

Sixteen industrial and professional leaders of organizations using alcohol for commercial and scientific purposes hold first meeting in Philadelphia Oct. 3 toward preparing plans for cooperation in administration of permissive features of prohibition act.

Dr. Fritz Haber, noted German industrial chemist, credits Germany's industrial recovery after the war to close relation of science and business.

Upjohn Co., Kalamazoo, Mich., chemical products manufacturer, begins work on new branch plant at Memphis, Tenn., to cost over $40,000.

Formation of European subsidiary of Standard-I.G. Co., to license patents and rights in oil hydrogenation processes on continent is reported. Leading oil companies of England, France, and Southern Europe are expected to take stock in proposed company, Germany patents being reserved for I.G.

Thirty Years Ago

From Our Files of Nov., 1915

Roessler & Hasslacher Chemical Co. receives a gold medal at the Panama-Pacific International Exposition, San Francisco, for its exhibit of cyanides.

General Chemical Co. declares an extra dividend, amounting to 15 per cent all told, payable in stock to holders of the common.

Natural Products Refining Co., Jersey City, New Jersey, plans construction of a new $50,000 plant extension.

Grasselli Chemical Co. declares an extra cash dividend and a special stock dividend of 10 per cent.

PART 2: PATENTS AND TRADEMARKS

Abstracts of U. S. Chemical Patents

A Complete Checklist Covering Chemical Products and Processes

Printed copies of patents are available from the Patent Office at 10 cents each. Address the Commissioner of Patents, Washington, D. C., for copies and for general information concerning patents or trade-marks.

From Official Gazette—Vol. 577, Nos. 2, 3, 4 (August 14-August 28)—p. 608

*Metallurgy, Ores

Producing iron powder for powder metallurgy which comprises forming brittle iron of white cast iron type, distintegrating material to form carbon-rich and carbon-poor components. No. 2,381,022. John Wulff.

Apparatus for producing iron powder and iron alloy powder for powder metallurgy comprising a furnace, a quenching means, etc. No. 2,381,-023. John Wulff.

Producing iron powder from reject metal shot of gray cast iron type which comprises subjecting reject fines to pickling operation to remove adherent oxides, washing, carburizing, and subjecting carburized product to magnetic separation. No. 2,381,024. John Wulff.

Composition for cleaning metals as aluminum or magnesium, which comprises aqueous solution containing sodium salts of orthophosphoric acid and silicic acid. No. 2,381,124. Joseph Hart to Kelite Products, Inc.

Magnesium-free aluminum base alloy containing copper, lithium, elements selected from cadmium, mercury, silver, tin, indium and zinc, and balance aluminum, said alloy characterized by higher tensile and yield strength in heat treated and aged condition. No. 2,381,219. Ira LeBaron to Aluminum Co. of America.

Chromium recovery. No. 2,381,236. Marvin Udy.

Controlling flowability of used molding sands containing argillaceous bonding material which comprises adding fluoride from sodium fluoride and potassium fluoride. No. 2,381,242. Robert Wood to Aluminum Co. of America.

Producing beryllium by thermal reduction of fluoridic beryllium salt selected from beryllium fluoride, ammonium beryllium fluoride and mixtures of these salts, etc. No. 2,381,291. Bengt Kjellgren to The Brush Beryllium Co.

Recovering magnesium from vapor mixture thereof with a non-condensable gas. No. 2,381,403. Douglas Chisholm to The Dow Chemical Co.

Recovery of magnesium. No. 2,381,405. Thomas Griswold, Jr. to The Dow Chemical Co.

Age-strengthened chromium-nickel stainless steel having same strength in all directions and free from directional strength characteristics of a cold-worked product, with structure that is partly low-temperature ferrite and partly austenite. No. 2,381,416. Ernest Wyche and Raymond Smith.

Killed iron or mild steel for deep drawing characterized by grain structure in which grain axis normal to plane of stock is less in dimension than both grain axes in plane of stock. No. 2,381,435. Robert Burns and Arthur McCabe to The American Rolling Mill Co.

Producing improved iron powder which comprises subjecting iron powder of high density composed of particles of mono-crystalline structure to a surface oxidation and then to reducing treatment to reduce iron thus oxidized. No. 2,381,440. Joseph Drapeau, Jr. to The Glidden Co.

Copper base alloy containing lead and metal selected from uranium and thorium. No. 2,381,497. Franz Hensel and Earl Larsen to P. R. Mallory & Co. Inc.

Recovering chromium which comprises forming charge comprising chromium-bearing material containing ferrous chromite and basic compound of lime and magnesia capable of substituting for ferrous oxide of ferrous chromite, etc. No. 2,381,565. Marvin Udy.

Carburizing steel comprising carbon, manganese, molybdenum, silicon to cause graphitization in presence of molybdenum, and iron. No. 2,381,-638. Frederick Bonte to The Timken Roller Bearing Co.

Apparatus for continuous pickling of strip metal comprising tank for holding a body of pickling solution having bottom, side walls and end walls, means adjacent end walls to guide strip metal through pickling solution, etc. No. 2,381,652. Steve Dishauzi to National Steel Corp.

Treating ores containing cassiterite and siderite which comprises, treating pulped ore with reagent containing amine having non-aromatic hydrocarbon chain having at least 12 carbon atoms. No. 2,381,662. Antoine Gaudin.

Production of tungsten containing ferrous alloys which comprises adding tungsten as tungsten monoxide to ferrous metal, reducing monoxide and absorbing tungsten in ferrous metal. No. 2,381,674. Arthur Linz to Climax Molybdenum Co.

Production of alloying briquettes which comprises blowing finely divided metallic oxide selected from oxides of molybdenum, tungsten and vanadium into chamber, spraying into chamber liquefied carbonaceous binding material to cause metallic oxide and carbonaceous material to be intimately mixed. No. 2,381,675. Arthur Linz to Climax Molybdenum Co.

Thermally treating a hot ingot of a precipitation hardening aluminum base alloy upon removal from ingot mold and preparatory to hot working so that wrought product is capable of undergoing recrystallization. No. 2,381,714. Paul Beck to Aluminum Co. of America.

Chill mixture containing 30 to 150 mesh size metal pellets, binding material, and a tempering medium containing corrosion inhibitor, said mixture characterized by moldable in its green condition, and having chilling effect sufficient to reduce grain size and shrinkage in casting. No. 2,381,734. Marvin Gantz to Aluminum Co. of America.

Chill mixture containing 30 to 150 mesh size metal pellets, finely divided graphite, a binding material and a tempering medium. No. 2,381,735. Marvin Gantz to Aluminum Co. of America.

Protecting ferrous article against corrosion which consists in depositing coating of nickel, then applying coating of tin, and then heating to diffuse part of tin into nickel. No. 2,381,778. James Schoonmaker, Jr. and Franklin Stockton to Standard Steel Spring Co.

Babbitting side face of ring of metal which comprises applying to and baking protective coating on side face and internal face of ring, removing coating from side face which is to be babbitted, centrifngally casting Babbitt metal on side face. No. 2,381,797. Sidney Adels to The Aviation Corp.

Decreasing iron impurity in mineral of sand, alumina, felspar, calcite, dolomite, etc., including water washing mineral, subjecting mineral to dilute solution of titanous sulphate, soaking mineral in solution containing titanous sulphate and hydrofluoric acid, etc. No. 2,381,843. Albert Sherlock to Pilkington Brothers Ltd.

*Organic

Esters of carboxycellulose. No. 2,379,917. Herman Mark and Sidney Siggia to E. I. du Pont de Nemours & Co.

Manufacture of organic isocyanates by reacting phosgene with a primary amine hydrochloride suspended in organic liquid. No. 2,379,948. Edward Burgoine, Benjamin Collie, and Randal New to Imperial Chemical Industries Ltd.

Metal salt of an N-polyhydroxyalkyldithiocarbamic acid wherein the N-polyhydroxyalkyl radical is that of a reducing sugar. No. 2,379,965. Madison Hunt to E. I. du Pont de Nemours & Co.

Separating fatty and resin acid components of tall oil, which comprises treating an acetone solution of tall oil with ammonia. No. 2,379,986. Emil Ott to Hercules Powder Co.

Preparing sulphanilyl guanidine which comprises fusing a metal salt of an acylsulphanilyl cyanamide with a compound which liberates ammonia to give an acylsulphanilyl guanidine, and hydrolyzing to give sulfanilyl guanidine. No. 2,380,006. Philip Winnek and Herman Faith to American Cyanamid Co.

Copolymer of asymmetrical dichloroethylene with a polymerizable ketone. No. 2,380,009. Harold Arnold and George Dorough to E. I. du Pont de Nemours & Co.

Recovering conc. vinyl benzene hydrocarbon fraction from a mixture with close boiling saturated benzene hydrocarbons having saturated side chain. No. 2,380,019. Ward Bloomer to The Lummus Co.

Dimethyldiethoxysilicane. No. 2,380,057. Rob McGregor and Earl Warrick to Corning Glass Works.

Cyanomethyl esters of dicarboxylic acids. No. 2,380,061. David Mowry to Monsanto Chemical Co.

Cyanomethyl cotonates. No. 2,380,062. David Mowry to Monsanto Chemical Co.

Cyanomethyl cinnamates. No. 2,380,063. David Mowry to Monsanto Chemical Co.

Sulphur-containing aliphatic hydrocarbon prepared by polymerizing ethylene in presence of oxide of a metal of iron group, etc. No. 2,380,072. James Reid to Phillips Petroleum Co.

Production of hydroxy ether which comprises reacting an epoxide compound with a monohydric alcohol in presence of stannic halide-alcohol complex. No. 2,380,185. Kenneth Marple and Theodore Evans to Shell Development Co.

Cyclic process for production of tartaric acid values which comprises oxidizing in aqueous solution mixture of carbohydrate material selected from glucose, fructose, pentoses, gluconic acid, 5 ketogluconic acid erythritol, and materials rapidly hydrolyzable to these by dilute nitric acid; and oxidation residue from a previous oxidation, with nitric acid, in presence of soluble vanadium compound catalyst. No. 2,380,196. Solomon Soltzberg to Atlas Powder Co.

Producing asymmetric ester-salts of morpholine which comprises reacting quaternary ammonium morpholinium halide with a mono-metal salt of an ester of a polybasic acid. No. 2,380,325. Joseph Niederl and Martin McGreal.

Producing N-di-n-butylaniline comprising hydrogenation of mixture of butyraldehyde and nitrobenzene in presence of hydrogenation catalyst and acetic acid. No. 2,380,420. William Emerson.

Crystalline mono-methyl ester of a galactonic acid. No. 2,380,444. Horace Isbell to the Government of the United States, as represented by the Secretary of Commerce.

Lactones of 2-alkyl-3-alkoxy-4-hydroxymethyl-5-carboxypyridine. No. 2,-380,478. Eric Stiller to Merck & Co. Inc.

Preparing chlorine substitution products of a tertiary olefin containing not more than five carbon atoms per molecule which comprises introducing chlorine into a body of olefin in liquid phase. No. 2,380,500. Hyym Buc and Clifford Muessig to Standard Oil Development Co.

Removing peroxides and organic impurities from impure low boiling ether which comprises treating ether with acidic solution containing dichromate ion. No. 2,380,524. John Hillyer to Phillips Petroleum Co.

Separation of mono- and di-alkyl esters of sulphuric acid. No. 2,380,532. Henry Kohler to Standard Oil Development Co.

Improving acid wash color stability of acid refined toluene which has deteriorated in storage which comprises treating toluene with maleic acid. No. 2,380,561. Francis Wadsworth to Pan American Refining Corp.

Preparing capryl salicylate by heating mixture of methyl salicylate and capryl alcohol, adding thereto sodium hydroxide. No. 2,380,563. Stephen Wayo and Franklin Watkins to Sinclair Refining Co.

Manufacture of water-soluble salts of 2-methyl-1,4-dihydroxynaphthalene diphosphoric acid. No. 2,380,621. Kurt Warnat to Hoffmann-La Roche, Inc.

Metal xanthate of sulfurized cardanol. No. 2,380,658. Rush McCleary and John Morris to The Texas Co.

Continuous production and recovery of acetone which comprises contacting vaporous mixture comprising propane and oxygen with hydrogen bromide, also regenerative of hydrogen bromide. No. 2,380,675. Frederick Rust and Edward Bell to Shell Development Co.

Esters of salicylic acid monosulphide and salts thereof. No. 2,380,685. Elmer Cook and William Thomas, Jr., to American Cyanamid Co.

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* *Continued from Vol. 576, Nos. 2, 3, 4, 5; Vol. 577, No. 1.*

Patents Available for License or Sale

The Patent Office is regularly publishing a Register of Patents Available for Licensing or Sale. Patents concerning chemical products and processes appear below.

August 28, 1945

Pat. 1,772,763. **Dandelion Exterminator.** Patented Aug. 12, 1930. Elongated tube-like device to discharge liquids into the crown of a plant only. Knob beveled on under side is attached to a stem extending from valve in the bottom of the tube. Knob contracting crown opens valve and liquid flows over knob into crown. (Owner) Walker Van Riper, 771 South High St., Denver, Colo. Group 35—22—61. Reg. 231.

Pat. 1,744,061. **Shaving Preparation.** Patented Jan. 21, 1930. Free from phenol-esters of higher fatty acids with a small and regulated amount of styptic incorporated therein. (Owner) Dr. Nathan Sulzberger, 128 Central Park South, New York 19, N. Y. Group 28—32—41. Reg. No. 225.

Pat. 1,844,516. **Casing-In Process.** Patented Feb. 9, 1932. Attachment of covers to a book by a dry adhesive which is rendered operatively soft by the application of heat electrically and applying pressure to the covers. (Owner) Walter Meyer, 40 Farrell Ave., Mount Vernon, N. Y. Groups 26—27; 27—32; 28—89—94; 35—55. Reg. No. 232.

Pat. 2,000,006. **Paper Making Machine.** Patented May 7, 1935. Including an outlet box movably connected to the head box and provided with means whereby it can be quickly moved out of the way without having to be disassembled or removed from the machine. Simplifies changing of the wire screen or apron. (Owner) Samuel A. Mantell, 532 17th St., Niagara Falls, N. Y. Group 35—54. Reg. No. 244.

Pat. 2,012,676. **Burner.** Patented Aug. 27, 1935. Steam is used in atomizing the supply of oil to the burner-head. Oil is projected into combustion chamber through deflected burning gases. May be installed in any type of heating plant. (Owner) Joseph C. Williams, 148-20 Ninth Ave., Whitestone, Long Island, N. Y. Group 33—62—63—65. Reg. No. 234.

Pat. 2,033,791. **Moistureproof Cigarette and Process of Making Same.** Patented Mar. 10, 1936. A wrapper for cigarettes which will not adhere to lips; tip is unnoticeable. Formula is recited in the patent. Color may be added. Paper may be one color and tip another. Both ends of wrapper, entire wrapper, or portions of wrapper may be treated. (Owner) Dr. Nathan Sulzberger, 128 Central Park South, New York 19, N. Y. Groups 21—11; 26—25; 35—59. Reg. No. 227.

Pat. 2,034,049. **Indicative Apparatus for Obtaining Undistorted Stereoscopic Views.** Patented Mar. 17, 1936. Featured by apparatus adapted for intra-oral and extra-oral use arranged to cooperate with an X-ray tube, such as Coolidge type, for production of stereoscopic radiographs. Film holder may be placed in patient's mouth. Provides means for positioning object to be X-rayed at proper angle. (Owner) Roman J. Levy, D. D. S., 2149 Southern Boulevard, Bronx 60, N. Y. Groups 36—92; 39—12—17. Reg. No. 239.

Pat. 2,204,757. **Safety Valve.** Patented June 18, 1940. For steam pipes or the like. Will automatically shut off the flow in event of rupture beyond the valve and seal the pipe until the break has been repaired. Valve is set to withstand normal pressure and a sudden decrease in pressure closes the valve. (Owner) Henry C. Henze, 616 Jackson Ave., Linden, N. J. Group 33—61—66. Reg. No. 217.

Pat. 2,366,746. **Equalizing Return Trap.** Patented Jan. 9, 1945. For one pipe heating system, to control the passage of steam therethrough in one direction toward a radiator or the like and also to control the flow of cnndensate therethrough in the opposite direction. Provides manual control or thermostatic control of heating system. (Owner) Michael E. Miller, 230 East Sola St., Santa Barbara, Calif. Group 33—61—65—66. Reg. No. 214.

September 4, 1945

Pat. 1,997,494. **Aluminum-Base Alloy.** Patented Apr. 9, 1935. Chill casting and casting properties generally of aluminum alloys high in iron may be considerably improved by adding suitable amounts of antimony. The grain structure is refined and porosity reduced. An important application would be in the utilization of secondary scrap aluminum, which, because of its high iron content, has been a poor casting base. (Owner) William E. Mansfield, 13623 Maplerow Avenue, Garfield Heights, Cleveland 5, Ohio. Groups 33—12—21; 34—41. Reg. No. 248.

Pat. 2,185,348. **Aluminum Base Alloy.** Patented Jan. 2, 1940. This supplements Pat. 1,997,494, but involves the additional use, in conjunction with antimony, of such metals as tungsten, members of the tungsten or vanadium group of metals, or vanadium, zirconium, or boron. The castings so produced are claimed to be superior to the similar alloys involving only the antimony additions. (Owner) William E. Mansfield, 13623 Maplerow Avenue, Garfield Heights, Cleveland 5, Ohio. Groups 33—12—21; 34—41. Reg. No. 249.

Pat. 2,188,203. **Aluminum Base Alloy.** Patented Jan. 23, 1940. Relates to aluminum-manganese-boron casting alloys, with tungsten and titanium being useful additives. Other alloying metals may likewise be present. Allows wider use of secondary scrap aluminum and results in physical properties and casting characteristics superior to similar alloys lacking boron or the other additives. (Owner) William E. Mansfield, 13623 Maplerow Avenue, Garfield Heights, Cleveland 5, Ohio. Groups 33—12—21; 34—41. Reg. No. 250.

Pat. 2,092,951. **Finding Apparatus.** Patented Sept. 14, 1937. Device for locating buried pipe, particularly non-metallic, including a tubular transformer with conical shaped ends and weighted and pivoted coil therein; coil remains perpendicular while transformer is horizontal. It is not necessary that pipe to be located function as part of device. (Owner) Frank N. Blake, 15 Highland Avenue, North Adams, Mass. Groups 32—54—71; 33—12—93; 39—11. Reg. No. 251.

Pat. Re. 21,711. **Pipe Finder.** Reissued Feb. 11, 1941. Orig. No. 2,192,765, dated Mar. 5, 1940. Device for locating buried pipes in which transformers, coil means, batteries, amplifier, phone tip sockets, etc., are combined in a container having multiple compartments. Can be carried around by one person wearing ear phones and turned on and off at will. (Owner) Frank N. Blake, 15 Highland Avenue, North Adams, Mass. Groups 32—54—71; 33—12—93; 39—11. Reg. No. 252.

Pat. 2,350,082. **Composition of Matter and Preparation and Process of Producing the Same.** Patented May 30, 1944. A fat containing food composition wherein jojoba nut oil is treated in such manner that resultant substance and derivatives incorporated therein are in various form. The oil itself, or each of the substances, or two or more, may be incorporated in shortening, cake, or the like. Main object is to provide a new shortening material with great emulsifying power. (Owner) Ilona Taussky. Address correspondence to Michael S. Striker, Attorney, 500 Fifth Avenue, New York 18, N. Y. Groups 20—51—92—99; 28—29. Reg. No. 261.

Pat. 1,904,892. **Rotary Engine Compressor and the Like.** Patented Apr. 18,1933. A mechanism which is equally adapted for use in the transmission of power in various types of rotary engines and in rotary compressors. (Co-owner) William L. Hoge, Heyburn Building, Louisville 2, Ky. Group 35—19—61. Reg. 264.

Pat. 2,367,402. **Valve Cutoff.** Patented Jan. 16, 1945. For pipe lines, particularly supply lines near gas meters. Valve is normally held open by releasable member made of plastic such as "Vinylite." When subjected to heat (135° F.) in case of fire, plastic readily deforms, thereby releasing valve stem which closes valve. Plastic member can be easily replaced and valve reset without tools or other equipment. (Owner) John F. Kelly, c/o Kelly Safety Device Company, 2196 West 65th Street, Cleveland 2, Ohio. Groups 28—83; 33—66; 35—65. Reg. No. 279.

September 11, 1945

Pat. 2,377,313. **Light Screening Eye Protection.** Patented June 5, 1945. Goggles utilizing fixed light polarizing lens and coaxial polarizing lens which may be turned relatively to the fixed lens to vary the light screening properties of the lens assembly. (Owner) Francis D. Casier, Ray Brook, N. Y. Groups 32—29; 36—19; 39—14. Reg. No. 284.

Pat. 2,174,164. **Plastic Compound.** Patented Sept. 26, 1939. Dielectric plastic or sealing compound particularly adapted for ducts or conduits used for underground electric cables and wires. It is fireproof, waterproof, noncorrosive; remains plastic and workable throughout changing climatic conditions and during long periods. Formula recited in patent. (Owner) Silvio Pellerano, 1918 Seventy-first Street, Brooklyn, N. Y. Groups 28—83—89; 32—40. Reg. No. 289.

Pat. 2,095,614. **Nonhardening Cement.** Patented Oct. 12, 1937. Cement or sealing compound. It is waterproof, noncorrosive; remains plastic and workable throughout changing climatic conditions and during long periods and will adhere to surfaces of various materials, such as tile, glass, steel, concrete, etc., without treating such surfaces. Formula recited in patent. (Owner) Silvio Pellerano, 1918 Seventy-first Street, Brooklyn, N. Y. Groups 28—83—89; 32—40. Reg. No. 290.

Pat. 2,311,437. **Weighing Scale.** Patented Feb. 16, 1943. Scale which can be adjusted to weigh light or heavy loads. Has graduated chart to indicate amount of various ingredients required to secure a desired result. The quantity can be weighed. Has means to indicate weight of material in detachable scoop. (Owner) John H. Homrighous, 1029 Wenonah Avenue, Oak Park, Ill. Groups 27—61; 35—74. Reg. No. 304.

Pat. 2,305,581. **Motor Control System.** Patented Dec. 15, 1942. Apparatus varies and controls frequency in motor input circuit to hold the speed of a motor uniform under changing load conditions or fluctuating power input. (Owner) Paul W. Homrighous, 1029 Wenonah Avenue, Oak Park, Ill. Group 38—31. Reg. No. 306.

Pat. 2,149,163. **Tubular Water Gauge Sight Glass.** Patented Feb. 28, 1939. Corrosion-resistant wire is placed in sight glass, spiral ends frictionally engage sides of glass, holding wire in position. Reduces formation of air bubbles, sedimentation on walls, and prevents cracking of glass under exceptional heat stresses. (Owner) William J. Corliss, 24 Palisade Road, Elizabeth 3,N. J. Groups 33—66; 35—43—69, Reg. No. 309.

Pat. 2,126,150. **Process for Making Gas.** Patented Aug. 9, 1938. Groups 28—86; 29—11. Reg. No. 311.

Pat. 2,216,792. **Gas Making Apparatus.** Patented Oct. 8, 1940. Division of Pat. 2,126,150. Groups 28—86; 29—11. Reg. No. 312.

The two patents listed above relate to process and apparatus for producing and reforming combustible gases. A finely divided volitalizable and/or hydrocarbonaceous material is introduced and partially or completely reformed gases are obtained from various levels of fuel bed. (Owners) Albert R. Stryker and Chester Tietig. Address correspondence to Albert R. Stryker, 107 Billups Drive, Lawrenceburg, Ind.

Pat. 2,200,607. **Method for Making Pure Hydrogen.** Patented May 14, 1940. Groups 28—86 29—11. Reg. No. 313.

Pat. No. 2,268,910. **Apparatus for Making Hydrogen.** Patented Jan. 6, 1942. Division of Pat. 2,200,607. Groups 28—86; 29—11, Reg. No. 314.

The two patents listed above relate to process and apparatus for making hydrogen of exceptional purity. Hydrogen pure enough for hydrogenation of oils to make edible fats can be bled off continuously. (Owners) Albert R. Stryker and Chester Tietig. Address correspondence to Albert R. Stryker, 107 Billups Drive, Lawrenceburg, Ind.

September 18, 1945

Pat 2,122,187. **Chemical Apparatus.** Patented June 28, 1938. Group 28—83—89. Reg. No. 317.

Pat. 2,122,188. **Process for Manufacturing Viscose.** Patented June 28, 1938. Group 28—83—89. Reg. No. 318.

The two patents listed above cover a process and apparatus for successfully xanthating alkali cellulose and dissolving resulting cellulose xanthate in alkali solution to form viscose. Both operations are carried out in a single closed chamber without opening machine. Reduces consumption of power and minimizes danger from fire and explosion as well as eliminating necessity for great care in operation and maintenance. (Owner) Harold B. Vollrath, 3808 Davis Place N. W., Washington 7, D. C.

Pat. 2,290,914. **Coated Pigment and the Preparation Thereof.** Patented July 28, 1942. For use in paints, etc.; may be obtained in relatively few minutes by subjecting a mixture of finely divided pigment and a small proportion of a suitable coating agent to mulling and mixing action while compressing mixture under substantial pressure. (Owner) Hirsch Machlin, 3022 Barnes Ave., Bronx 67, N. Y. Group 28—11—12—83. Reg. No. 325.

Pat. 1,962,657. **Tank Heater.** Patented June 12, 1934. For heating oil, asphalt, or the like. A substantially circular heating chamber housing a torch disposed inside along bottom of a horizontal cylindrical tank constructed so that material and heat are circulated. Reduces to minimum danger from fire or explosion. Only one heating torch is necessary where ordinarily two are required. (Owner) Nathan V. Hendricks, 327 Crystal Springs Ave., Adrian, Mich. Groups 33—69; 34—95; 35—31. Reg. No. 327.

From Official Gazette—Vol. 577, Nos. 2, 3, 4 (August 14-August 28)—p. 610

Carboxylic acid esters of s-alkylol isothioureas. No. 2,380,697. David Jayne, Jr. and Harold Day to American Cyanamid Co.

Alkali-metal salt of a mono-ester of a mono-alkenyl-succinic acid and an aliphatic alcohol. No. 2,380,699. Lucas Kyrides to Monsanto Chemical Co.

Dehydrating castor oil which comprises passing castor oil over catalyst comprising a calcined composite of a phosphoric acid and a siliceous adsorbent. No. 2,380,720. Herman Bloch to Universal Oil Products Co

Production of unsaturated ketones. No. 2,380,828. Robert Dreisbach and George Heusted to The Dow Chemical Co.

Recovering pure aliphatic conjugated pentadiene from a mixture containing same and also cyclopentadiene. No. 2,380,831. Frederick Frey to Phillips Petroleum Co.

Decomposing monosulphone of aliphatic conjugated diolefin. No. 2,380,832. Frederick Frey and Harold Hepp to Phillips Petroleum Co.

Decomposition of diolefin monosulphones. No. 2,380,833. Frederick Frey and Harold Hepp to Phillips Petroleum Co.

Production of nitration grade toluene from hydrocarbon fraction containing paraffins, naphthenes and aromatics. No. 2,380,853. Norman Linn and Carl Tongberg to Standard Oil Development Co.

Catalytic dehydrogenation of a butene to produce 1,3-butadiene in presence of an active bauxite-barium hydroxide catalyst mass which progressively declines in activity on continued use. No. 2,380,875. Walter Schulze to Phillips Petroleum Co.

Catalyst for dehydrogenation of olefins to diolefins which consists of bauxite and compound selected from oxides and hydroxides of barium and strontium. No. 2,380,876. Walter Schulze, John Hillyer and Harry Drennan to Phillips Petroleum Co.

Soluble benzyl ether of dextran. No. 2,380,879. Grant Stahly and Warner Carlson to Chemical Developments Corp.

Preparing acyl cellulose polycarboxylates which comprises esterifying a partially acylated cellulose with a polycarboxylic acid compound in presence of 1,4-dioxane. No. 2,380,896. Frank Kaszuba to General Aniline & Film Corp.

Dialkyl alkylene bis-ureas. No. 2,380,934. William Boon to Imperial Chemical Industries Ltd.

Stabilized solution of copper mercaptides which comprises liquid non-polar organic solvent having dissolved therein copper mercaptide of an aliphatic mercaptan and to stabilize solution, organic carboxylic acid. No. 2,380,976. Ernest Korb and John Sabina to E. I. du Pont de Nemours & Co.

Preparing organosilicon halides which comprises effecting reaction between silicon and a hydrocarbon halide. No. 2,380,995. Eugene Rochow to General Electric Co.

Preparing organosilicon halides which comprises effecting reaction between hydrocarbon halide and silicon component of a solid, porous contact mass obtained by firing under reducing conditions a mixture of powdered silicon and metallic catalyst. No. 2,380,996. Eugene Rochow and Winton Patnode to General Electric Co.

Solid, porous contact mass used in chemical reaction between silicon and a hydrocarbon halide, said mass comprising silicon and a metallic catalyst. No. 2,380,997. Winton Patnode to General Electric Co.

Effecting reaction between heated silicon and gaseous mixture of hydrogen and alkyl halide. No. 2,380,998. Murray Sprung and William Gilliam to General Electric Co.

Preparation of organosilicon halides which comprises effecting reaction between silicon and a halogenated hydrocarbon in presence of inert gas. No. 2,380,999. Murray Sprung and William Gilliam to General Electric Co.

Halogenated organosilicon compounds. No. 2,381,000. Winton Patnode and Robert Schiessler to General Electric Co.

Preparing tetrachloroethylene and chlorosilanes which comprises effecting reaction between heated silicon and carbon tetrachloride in presence of metallic catalyst. No. 2,381,001. Winton Patnode and Robert Schiessler to General Electric Co.

Silicon compound having formula (Cl_2SiCH_2) x wherein x is equal to at least 3. No. 2,381,002. Winton Patnode and Robert Schiessler to General Electric Co.

Preparing N,N'-dialkyl-p-phenylenediamine comprising hydrogenating mixture of a N-alkyl-p-nitroaniline and compound selected from aliphatic aldehydes and ketones, in presence of a catalyst comprising mixture of copper, chromium, and barium oxides. No. 2,381,015. Harold Von Bramer and Lee Davy to Eastman Kodak Co.

Recovery of purified methyl ethyl ketone from impure aqueous solution, which comprises distilling aqueous solution of methyl ethyl ketone together with liquid aliphatic hydrocarbon so as to form a heterogeneous ternary azeotrope. No. 2,381,032. Joseph Bludworth and Guiles Flower, Jr. to Celanese Corp. of America.

Preparing monochloro-1,3-butadienes from butane. No. 2,381,037. Albert Carter and Frank Johnson to E. I. du Pont de Nemours & Co.

Continuously producing hydrogen chloride and conjugated diene of formula $C_4H_{(6-x)}Cl_x$ wherein x is small whole number of O and 1 by pyrolyzing chlorinated straight-chain hydrocarbon, etc. No. 2,381,038. Albert Carter and Albert Willett, Jr. to E. I. du Pont de Nemours & Co.

Preparing a N-phosphono-phosphato-alkyl aryl amine comprising reacting a N-alkenyl aryl amine with phosphorus and oxygen. No. 2,381,071. James McNally and Joseph Dickey to Eastman Kodak Co.

Condensation products of triazines and substitute triazines with alkylene oxides. No. 2,381,121. Walter Ericks to American Cyanamid Co.

Preparing tetrakis-2-chloroethyl silicate which comprises reacting ethylene oxide with silicon tetrachloride. No. 2,381,137. Winton Patnode and Robert Sauer to General Electric Co.

2-Halogenoethoxy silicon compounds. No. 2,381,138. Winton Patnode and Robert Sauer to General Electric Co.

Resolving azeotropic mixture of trimethylchlorosilane and tetrachlorosilane which comprises converting chlorosilanes to corresponding chloroethoxy derivatives by reaction with ethylene oxide. No. 2,381,139. Robert Sauer to General Electric Co.

Diazo salt preparations containing diazo salt and aliphatic sulfonic acid compound selected from aliphatic mono- and poly-sulfonic acids and water-soluble salts thereof. No. 2,381,145. William von Glahn and Clemens Streck to General Aniline & Film Corp.

Dehydration of unsaturated alcohols by heating mixture containing sulphonic acid salt of an aromatic amine, with an unsaturated monohydric

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alcohol, in admixture with saturated monohydric alcohol, to cause dehydration of part of said unsaturated alcohol. No. 2,381,148. Charles Weizmann.

Production of alkyl aromatic hydrocarbons. No. 2,381,175. William Mattox to Universal Oil Products Co.

Purification of dihydroxy benzene compounds. No. 2,381,209. William Cotton to Pennsylvania Coal Products Co.

Producing zingerone comprising forming solution consisting of vanillalacetone dissolved in solvent selected from methanol, ethanol, ether, etc., therewith Raney nickel catalyst, subjecting mixture to hydrogenation. No. 2,381,210. William Cotton to Pennsylvania Coal Products Co.

Separation of diolefin from hydrocarbon mixture by selective extraction with solution comprising cuprous salt dissolved in a pyridine base. No. 2,381,311. Richard Robey and Miller Swaney to Jasco, Inc.

Hydrogenolysis of a polyhydroxy aliphatic compound chosen from mono- and disaccharides which comprises subjecting compound to action of hydrogen in presence of organic liquid medium, and catalyst comprising coprecipitated cupric oxide and calcium fluoride. No. 2,381,316. Leonard Stengel and Frank Maple to Commercial Solvents Corp.

Preparing myosmine which comprises pyrolyzing pure nicotine in presence of quartz. No. 2,381,328. Charles Woodward and Abner Eisner and Paul Haines to the United States of America, as represented by the Secretary of Agriculture.

Organo-dihalogenosiloxanes. No. 2,381,366. Winton Patnode to General Electric Co.

Preparing methyl-gamma-cyanopropyl ketone which comprises reacting acetone with acrylonitrile, in presence of alkaline condensing agent. No. 2,381,371. Olyn Shannon to E. I. du Pont de Nemours & Co.

Aliphatic dinitro tetranitrates. No. 2,381,406. Henry Hass and Wilbur McElroy to Purdue Research Foundation.

Nitro amines and process for preparing same. No. 2,381,408. Murray Senkus to Commercial Solvents Corp.

Recovery of isoprene from hydrocarbon mixtures comprising same and piperylene. No. 2,381,409. Stephen Stowe to The Dow Chemical Co.

Preparing esters of endoethylene hydroxycyclopentanoindane which comprises reacting 1,4-endomethylene tetrahydro-gamma²-fluorene in presence of acidic condensing agent with a carboxylic acid. No. 2,381,433. Herman Bruson to The Resinous Products & Chemical Co.

Production of amines and nitriles, which comprises passing mixture of olefine and ammonia through bed of catalyst. No. 2,381,470. John Teter to Sinclair Refining Co.

Production of amines and nitriles, which comprises suspending in contact with ammonia and an olefine, a catalyst selectively promoting amination. No. 2,381,471. John Teter to Sinclair Refining Co.

Production of amines, nitriles and acid amides, which comprises subjecting mixture of an olefine, ammonia and water to action of catalyst. No. 2,381,472. John Teter to Sinclair Refining Co.

Production of organic compounds containing nitrogen wherein an olefinic hydrocarbon is reacted with ammonia in presence of catalyst comprising cobalt suspended on carrier, which comprises promoting suspended cobalt catalyst by presence of manganous oxide. No. 2,381,473. John Teter to Sinclair Refining Co.

Chlorbenzyl ester of a xanthic acid. No. 2,381,483. Edward Blake and Kenneth Godfrey to Monsanto Chemical Co.

Preparing butadiene from n-butane. No. 2,381,691. Walter Schulze and John Hillyer to Phillips Petroleum Co.

Producing butadiene from n-butane which comprises passing n-butane over a bauxite-metallic oxide, dehydrogenation catalyst, etc. No. 2,381,692. Walter Schulze and John Hillyer to Phillips Petroleum Co.

Preparing pentadiene from n-pentane. No. 2,381,693. Walter Schulze and John Hillyer to Phillips Petroleum Co.

Production of a 1-nitro-propene which comprises condensing acetylene in liquid phase with a nitroparaffin, in presence of a condensation catalyst consisting of a mercuric salt of an inorganic acid. No. 2,381,701. Hanns Stuadinger and Karl Tuerck to The Distillers Co. Ltd.

Removal, by selective oxidation, of acetylene from gaseous mixture containing it in admixture with hydrocarbons of less than four carbon atoms in molecule which comprises passing mixture in admixture with available oxygen over heated metallic copper. No. 2,381,707. William Wood and Bertram Bowen to The Distillers Co. Ltd.

Production of amines and nitriles, which comprises reacting olefine with ammonia. No. 2,381,709. Frank Apgar and John Teter to Sinclair Refining Co.

Preparing pyridine carboxylic acids. No. 2,381,794. John Weijlard, John Messerly and Max Tishler to Merck & Co. Inc.

Sulphides of alkylated aryl, oxyorganic carboxylic acids. No. 2,381,854. Orland Reiff to Socony-Vacuum Oil Co. Inc.

Preparing pentaerythritol by condensation in aqueous solution of formaldehyde and acetaldehyde in presence of lime, improvement which comprises neutralizing lime, after condensation, with acid from formic, acetic, and proprionic acids. No. 2,381,855. LeRoy Spence and Charles McKeever to The Resinous Products & Chemical Co.

*Paints, Pigments

Typographic ink composition comprising polymerized rosin, mineral oil, and a pigment. No. 2,379,950. Irwin Clare to Hercules Powder Co.

Making red modification litharge. No. 2,380,096. Donald Doan and Leonard Vaughn to The Eagle-Picher Lead Co.

Non-viscous felt base floor covering print paint vehicle comprising products resulting from reaction of soy-bean oil, rosin, maleic anhydride, monoglyceride formed by reaction of soy-bean oil and glycerol. No. 2,381,486. Samuel Cohen, Charles Thurmond and Lee Read to The Paraffine Companies, Inc.

Accelerating rate of drying consisting of incorporating into drying oil a high molecular weight fatty acid glyceride of class of diglyceride and triglyceride. No. 2,381,653. Folsom Drummond to New Wrinkle, Inc.

Non-toxic, non-inflammable rotogravure ink comprising a pigment, and binder dissolved in solvent comprising fluorochloroalkane, forming ink having solvent release and high speed of evaporation. No. 2,381,753. Clarence Irion to General Printing Ink Corp.

*Paper, Pulp

Combined grease proof and water repellent paper containing an N-acylated aminobiphenyl where acyl group is of fatty acids ranging from C12 to C28. No. 2,380,043. Carroll Hochwalt to Monsanto Chemical Co.

Safety paper bearing alteration-indicating composition comprising film-forming vehicle, a normally-colorless dye which develops color when subjected to action of ink eradicators, and an acid-reacting non-volatile buffering agent. No. 2,380,195. Burgess Smith to The Todd Co. Inc.

Purifying sulphite liquor. No. 2,380,504. Gosta Danielsson to The De-Laval Separator Co.

Preparing wood pulp for acetylation purposes which comprises treating pulp with aqueous caustic alkali until partial mercerization has occurred followed by treating with aqueous solution of alkali metal salt of weak acid. No. 2,380,706. George Richter to Eastman Kodak Co.

Utilizing calcium sulfite broke in manufacture of paper by incorporating same in the furnish to paper making machine. No. 2,381,600. Otto Kress and Frank Zeitlin and Robert Staman to West Virginia Pulp and Paper Co.

*Petroleum

Increasing octane number of thermally cracked naphtha which comprises contacting with a catalyst that has previously become coated with a carbonaceous deposit in gas oil cracking step. No. 2,379,966. Everett Johnson to Standard Oil Co.

Alkylating isobutane with low-boiling aliphatic olefins employing liquid anhydrous hydrogen fluoride as catalyst. No. 2,380,010. Philip Arnold to Phillips Petroleum Co.

Production of aromatic hydrocarbons from aliphatic hydrocarbons which comprises subjecting aliphatic hydrocarbons to catalyst comprising oxide selected from vanadium oxide, molybdenum oxide and chromium oxide, in admixture with barium peroxide. No. 2,380,035. Kenneth Edson and Frank Fisher to Skelly Oil Co.

Circulating aqueous drilling fluid in a well and forming impervious sheath on walls which comprises preparing aqueous suspension of clay, adding emulsion of asphalt to form an oil-in-water emulsion. No. 2,380,156. William Dobson and Albert Frye and Truman Griggs to Richfield Oil Corp.

Reforming naphtha which comprises contacting naphtha with catalyst prepared by impregnating activated solid adsorbent with aluminum chloride vapors. No. 2,380,228. Stewart Fulton and Thomas Cross to Standard Oil Development Co.

Condensing olefinic hydrocarbons in presence of a condensation catalyst composition comprising normally liquid condensation catalyst and solid adsorbent material. No. 2,380,234. Homer Hall to Standard Oil Development Co.

Apparatus for effecting liquid phase catalytic hydrocarbon reactions in presence of liquid catalyst heavier than and immiscible with proportion of said hydrocarbon reactants which comprises a horizontally elongated reaction chamber having elongated side walls and short end walls, etc. No. 2,380,245. Percival Keith and Myrle Perkins to The M. W. Kellogg Co.

Obtaining representative sample from high pressure distillate well. No. 2,380,271. Robert Sullivan and Joe Miller to Standard Oil Development Co.

Producing pure toluene from petroleum distillates. No. 2,380,279. Albert Welty, Jr. to Standard Oil Development Co.

Treating and blending heating oils. No. 2,380,294. Artie Cato, George Wash, and Albert Schmidl to Standard Oil Development Co.

Cleaning surfaces of petroleum refinery distillation equipment contaminated by highly carbonaceous material and bonded by heavy hydrocarbons soluble in solvents for aromatic type hydrocarbons which consists in washing surfaces with light petroleum naphtha, vaporizing furfural in distillation equipment. No. 2,380,340. James Simpson to Standard Oil Development Co.

Improved Diesel fuel comprising hydrocarbon distillate, ignition accelerator which causes lowering of flash test of distillate and non-inflammable halogenated hydrocarbon to raise flash test on final blended fuel. No. 2,380,341. Wesley Sowers to The Pure Oil Co.

Separating and concentrating isobutene. No. 2,380,350. Earl Willauer and Insley Jones to Standard Oil Development Co.

Desalting a salty mineral oil of low water content. No. 2,380,458. Gordon Nees and Roderick Perkins, Jr. to Petrolite Corp. Ltd.

Converting hydrocarbon oils into high knock rating motor fuels which comprises subjecting oils to action of catalyst consisting of magnesia and a solid refractory insoluble fluosilicate. No. 2,380,489. James Bailie to Standard Oil Co.

Converting hydrocarbon oils into high knock rating gasoline, comprising adding aluminum fluosilicate to catalyst, whereby deposit of carbonaceous matter on catalyst is diminished. No. 2,380,490. Melvin See to Standard Oil Co.

Safety device for catalytic converters for preventing damage to catalyst. No. 2,380,495. Daniel Banks to Sun Oil Co.

Producing from subsurface reservoir by gas lift a crude oil tending to deposit paraffin, which comprises introducing into oil well, a mixed fluid comprising a gas and liquefiable hydrocarbons dispersed in gas, whereby crude oil is aerated and is caused to flow avoid deposition of paraffin. No. 2,380,639. Wilson Eris to The Texas Co.

Prepared catalyst having low sludge forming characteristics comprising small lumps of high crushing strength of aluminum chloride which has been fused and is impregnated with hydrogen chloride. No. 2,380,703. Charles Montgomery and Norman Franke to Gulf Research & Development Co.

Coking hydrocarbon oils. No. 2,380,713. Howard Wilson to The Texas Co.

Separating aromatic hydrocarbon from a gasoline distillate containing it together with more saturated hydrocarbons and diolefins wherein distillate is distilled in contact with a phenolic solvent, etc. No. 2,380,723. Guy Cunningham to Shell Development Co.

Restoring clay-type alumina-containing catalyst which has become spent in alternate conversion of hydrocarbons and regenerations and which has acquired iron content which comprises leaching catalyst with aqueous solution of organic acid selected from oxalic acid, acetic acid and lactic acid. No. 2,380,731. Leonard Drake and John Herman and Eugene Scafe to Socony-Vacuum Oil Co. Inc.

Catalytic conversion of hydrocarbon oil. No. 2,380,760. Lyman Huff to Universal Oil Products Co.

Processing residual oils. No. 2,380,897. Eger Murphree, Alexis Voorhies, Jr., Leonard Bonnell and Louis Tregre to Standard Catalytic Co.

Inhibiting cracking in aromatizing of hydrocarbons, which comprises subjecting naphtha to 750-1200° F. in presence of an aromatizing catalyst and a butane. No. 2,380,938. Robert Burk to The Standard Oil Co.

Converting hydrocarbons into lower boiling hydrocarbons which comprises subjecting to cracking conditions in presence of halogenated organic compound containing unsaturated open chain group selected from bromine and iodine compounds. No. 2,380,958. Hillis Folkins and Carlisle Thacker to The Pure Oil Co.

Obtaining representative samples of gas and its liquefiable constituents

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from a gas well consisting of converting fluids flowing from well in two-phase liquid and vapor flow to single-phase vapor flow. No. 2,380,977. James Lewis, one-half to Robert Wilson.

Alkylating isoparaffin which comprises contacting isoparaffin and a neutral polyalkyl ester of a polybasic mineral acid with concentrated sulphuric acid No. 2,381,041. Johan de Jong to Shell Develpoment Co.

Separating mixture of hydrocarbons into its more paraffinic and more aromatic constituents, which comprises extracting with organic sulfide having formula $RSC_2H_4NH_2$ wherein R designates group selected from aminoalkyl group, the hydroxyalkyl group, etc. No. 2,381,092. Alexander Wilson to Carbide and Carbon Chemicals Corp.

Converting normally gaseous olefin hydrocarbon to higher molecular weight aliphatic olefins. No. 2,381,198. Grant Bailey and James Reid to Phillips Petroleum Co.

Manufacture of aviation gasoline. No. 2,381,256. John Callaway to The Texas Co.

Decolorizing hydrocarbon oil, which comprises contacting with Georgia-Florida type fuller's earth which has been extruded in plastic state at elevated pressure in admixture with water-soluble alkaline agent, and thereafter dried, reduced to granular particles, and calcined. No. 2,381,293. William LaLande, Jr. to Attapulgus Clay Co.

Isomerization which comprises contacting naphtha containing hexanes with catalyst consisting of aluminum halide. No. 2,381,434. Robert Burk and Herman Lankelma to The Standard Oil Co.

Isomerizing paraffin hydrocarbons of butane to hexane boiling range by means of liquid aluminum chloride-hydrocarbon complex catalyst. No. 2,381,439. Edmond d'Ouville and Bernard Evering to Standard Oil Co.

Production of gasoline stocks of high aromatic content. No. 2,381,466. Walter Schulze and Jesse Guyer to Phillips Petroleum Co.

Converting normally gaseous hydrocarbons to normally liquid products in presence of a catalyst prepared by treating alumina gel with a complex fluoric acid. No. 2,381,481. John Anderson to Standard Oil Co.

Production of aromatic hydrocarbons of motor fuel range from gas oil produced by cracking mineral oil, said gas oil containing polycyclic aromatic hydrocarbons having condensed structure of at least 3 rings. No. 2,381,522. Meredith Stewart to The Texas Co.

Isomerizing paraffin hydrocarbons to increase branching thereof which comprises contacting hydrocarbons with contact mass comprising catalyst suppoer comprising alumina having aluminum fluoride on its surface and impregnated with aluminum chloride. No. 2,381,562. Meredith Stewart to The Texas Co.

Regeneration of sulfur-poisoned solid contact metal and metal oxide hydrogenation catalysts. No. 2,381,659. Frederick Frey to Phillips Petroleum Co.

Catalytic dehydrogenation of a hydrocarbon, method for reducing induction period of catalyst, which comprises heating catalyst in free hydrogen and flushing catalyst with gas comprising hydrocarbon that is more unsaturated than hydrocarbon which is to be dehydrogenated. No. 2,381,677. Maryan Matuszak to Phillips Petroleum Co.

Producing gasoline from heavier hydrocarbon oils which comprises cracking in presence of catalyst consisting of a calcined mixture of a precipitated silica hydrogel and a precipitated chromia hydrogel. No. 2,381,820. Aristid Grosse and William Mattox to Universal Oil Products Co.

Catalytic conversion process with catalyst prepared by compositing hydrated silica with precipitated hydrous oxide of metal selected from chromium, molybdenum and uranium and calcining composite, catalyst being free of alkali metal ions. No. 2,381,825. Edward Lee, deceased, by Julia Lee, administratrix, and Jacob Ahlberg to Universal Oil Products Co.

Converting hydrocarbon oil into gasoline which comprises heating oil and butane fraction under cracking conditions in presence of phosgene and compounds selected from hydrogen fluoride, boron fluoride, and carbonyl fluoride. No. 2,381,828. Carl Linn and Vladimir Ipatieff to Universal Oil Products Co.

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**Photographic*

Preparing medium for making camera copy, which consists in imprinting upon surface a pattern consisting of spaced parallel lines of a tacky substance, dusting said surface with basic lead sulphate, etc. No. 2,379,915. Maurice McIntosh to Louis Sanders.

Photographic element bearing a water-permeable colloid layer containing a light-sensitive material and a polyvinyl acetal capable of reacting with a diazo compound to form an azo dye. No. 2,380,032. George Dorough and David Malcolm to E. I. du Pont de Nemours & Co.

Silver halide emulsion containing as color former fast to diffusion an amide of a color former and acetal obtained by condensation of polyvinyl alcohol with aromatic aminoaldehyde. No. 2,380,033. George Dorough and David McQueen to E. I. du Pont de Nemours & Co.

Increasing speed of silver halide photographic emulsion, which comprises adding water-soluble salt of an unsaturated, lower aliphatic acid. No. 2,380,280. Walter Weyerts to Eastman Kodak Co.

Color couplers for photographic color development. No. 2,380,809. Honore Verkinderen and Norbert Vankeirsbilck.

Photographic silver halide emulsion, spectrally sensitized with cyanine dye containing, as supersensitizer, an aromatic nitrile. No. 2,380,940. Burt Carroll and John Spence to Eastman Kodak Co.

Producing photographic print by exposing to light under negative a pigmented gelatin sheet saturated with aqueous solution of alkali bichromate, and developing gelatin sheet in hot water. No. 2,381,234. Ernest Symmes.

Producing plate for ink and dye printing which includes providing a woven wire screen, weave of wire presenting a toothed or grained surface, applying a thin film of photo-sensitive halide emulsion to surface, exposing plate photographically, developing, fixing and washing said plate, etc. No. 2,381,704. Bennett Terry.

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*Polymers

Stiffening material comprising splints of quills of feathers secured together in parallel overlapping relation to provide a cord or rod-like elongated element and elongated tough rod formed of a vinylidene chloride resin composition. No. 2,379,881. Frederic Chamberlain to The Warren Featherbone Co.

Tough, resilient and elastic composition having a D.C. resistivity less than 500 ohm-cm. and capable of grounding an electrostatic charge, comprising a highly polymerized vinyl chloride resin in combination with a plasticizer and finely-divided carbon black. No. 2,379,976. Bruce Maddock to Carbide and Carbon Chemicals Corp.

Making modified and softened rosin product from hard and brittle rosin, which comprises dispersing in rosin, tetrachloro, resorcinol, etc. No. 2,380,141. Laszlo Auer to Ridbo Laboratories, Inc.

Improving color qualities of resinous condensate obtained by reacting aldehyde in presence of a condensing agent with a lower aliphatic ketone. No. 2,380,142. Seaver Ballard and Vernon Haury to Shell Development Co.

Preparing dry heat-setting adhesive that remains stable for extended period, which comprises applying aqueous solution of a urea-formaldehyde condensation product, to a surface together with an ammonium salt of a strong acid and polyhydric phenol. No. 2,380,239. Arthur Howald to Libbey-Owens-Ford Glass Co.

Making oil-soluble phenolformaldehyde resin which comprises combining heat-convertible, oil-incompatible phenol-formaldehyde resin and reaction product obtained by heating together an unsaturated dicarboxylic acid, an abietate of an alkyl alcohol, and heat-treated, reactive soya bean oil. No. 2,380,307. Arthur Haroldson to Continental-Diamond Fibre Co.

Converting cashew nut shell liquid into hardened plastic product capable of being stored and shipped without loss due to decomposition or loss of constituents by bleeding which comprises mixing and reacting with alkaline earth metal compound, etc. No. 2,380,319. Roland Kremers to General Foods Corp.

Polymerizing mixture of vinylidene halide from vinylidene chloride, bromide, and chlorobromide with a diene of 1,3-butadiene, isoprene, and 2,3-dimethyl-1,3-butadiene while in aqueous dispersion in presence of alkali metal hydroxide. No. 2,380,356. Mortimer Youker to E. I. du Pont de Nemours & Co.

Polymerization of straight-chain olefins which comprises contacting straight-chain olefin with catalyst comprising activated carbon and a reduced metal selected from nickel and cobalt. No. 2,380,358. John Anderson and Walter Peterson and Sumner McAllister to Shell Development Co.

Polymerization of butadiene-1,3 hydrocarbons. No. 2,380,400. George Browning, Jr. to The B. F. Goodrich Co.

Polymerizing butadiene-1,3 hydrocarbon in aqueous emulsion in presence of an alkoxythiono benzoyl monosulfide. No. 2,380,401. George Browning, Jr. to The B. F. Goodrich Co.

Polymerization of butadiene-1,3 hydrocarbons. No. 2,380,402. George Browning, Jr. to The B. F. Goodrich Co.

Polymerizing conjugated butadiene hydrocarbon in aqueous emulsion in presence of compound containing 2-thiothiazyl group and a simple ionizable nickel salt. No. 2,380,403. George Browning, Jr., William Stewart and Benjamin Zwicker to The B. F. Goodrich Co.

Polymerizing conjugated butadiene hydrocarbon in presence of compound containing 2-thiothiazyl group and a simple ionizable mercury salt. No. 2,380,404. George Browning, Jr., William Stewart, and Benjamin Zwicker to The B. F. Goodrich Co.

Polymerizing conjugated butadiene hydrocarbon in presence of compound containing 2-thiothiazyl group and a simple ionizable cobalt salt. No. 2,380,405. George Browning, Jr., William Stewart and Benjamin Zwicker to The B. F. Goodrich Co.

Polymerizing butadiene hydrocarbon in aqueous emulsion in presence of compound containing the 2-thiothiazyl group. No. 2,380,426. Charles Fryling to The B. F. Goodrich Co.

Effecting formation of plastic body containing combined halogen by heating chlorinated petroleum wax with aromatic compound chosen from phenol, naphthols and diphenyl ether in presence of a Friedel-Crafts catalyst and thereafter sulfurizing body by heating with solution of alkaline sulfide. No. 2,380,466. Orland Reiff and John Zech to Socony-Vacuum Oil Co. Inc.

Catalysts for addition polymerization of unsaturated organic compounds. No. 2,380,475. William Stewart to The B. F. Goodrich Co.

Catalyst for addition polymerization of unsaturated organic compounds, comprising a water-soluble heavy metal salt combined with a sugar. No. 2,380,476. William Stewart to The B. F. Goodrich Co.

Catalyst for addition polymerization of unsaturated organic compounds, comprising a water soluble heavy metal salt in combination with naturally occurring compound containing a cyclopentenophenanthrene ring. No. 2,380,477. William Stewart to The B. F. Goodrich Co.

Polymerization butadiene in aqueous emulsion in vessel in which surfaces contacting emulsion are constructed of alloy containing nickel, chromium, and iron. No. 2,380,551. Waldo Semon to The B. F. Goodrich Co.

Polymerizing butadiene in aqueous emulsion in ferrometallic vessel having coating of insoluble iron phosphates on inside surfaces. No. 2,380,552. Waldo Semon and William Stewart to The B. R. Goodrich Co.

Preparing aqueous emulsion comprising butadiene-1,3, bringing emulsion into contact with surface consisting of water-insoluble higher oxide of iron and polymerizing butadiene-1,3. No. 2,380,554. Frank Schoenfeld to The B. F. Goodrich Co.

Polymerizing a butadiene-1,3 hydrocarbon in aqueous emulsion in presence of emulsifying agent, emulsion polymerization catalyst and a saturated aliphatic monoamino monocarboxylic alpha-amino acid. No. 2,380,591. Charles Fryling to The B. F. Goodrich Co.

Making catalyst for polymerization reactions, said catalyst comprising complex heavy metal pyrophosphate in high degree of purity, which comprises reacting alkali metal, heavy metal oxalate and alkali metal pyrophosphate. No. 2,380,614. Waldo Semon to B. F. Goodrich Co.

Polymerizing mixture of butadiene and a monomer copolymerizable therewith in aqueous emulsion, in presence of water-soluble salts of iron and cobalt and a water-soluble pyrophosphate. No. 2,380,617. William Stewart and Benjamin Zwicker to The B. F. Goodrich Co.

Polymerizing butadiene-1,3 in aqueous emulsion in presence of compound selected from thiobarbituric acid, phenylthiohydantoic acid, etc. No. 2,380,618. William Stewart and Benjamin Zwicker to The B. F. Goodrich Co.

Polymerizing mixture of butadiene-1,3 and a monomer copolymerizable therewith in aqueous emulsion, in presence of mixture of dicyandiamidine and a water-soluble salt of a heavy metal of group VIII. No. 2,380,710. William Stewart to The B. F. Goodrich Co.

Chlorinated mixed polymerizate of 1,3-butadiene and acrylic nitrile containing from 1 to 3% by weight of chlorine. No. 2,380,726. Gaetano D'Alelio to General Electric Co.

Stabilization of a polyvinyl acetal resin formed in presence of a mineral acid catalyst. No. 2,380,824. Joseph Dahle to Monsanto Chemical Co.

Polymerization of butadiene-1,3 hydrocarbons. No. 2,380,905. William Stewart to The B. F. Goodrich Co.

Polyvinyl acetal composition plasticized with amide formed by polyalkylene polyamine and a monocarboxylic fatty acid. No. 2,380,925. LaVerne Cheyney to Wingfoot Corp.

Polyvinyl acetal composition plasticized with alcohol from group consisting of oleyl alcohol and phytol. No. 2,380,926. LaVerne Cheyney to Wingfoot Corp.

Plastic mix for refractory mold, comprising refractory filler, and binder comprising non-inflammable liquid which contains silica as aqueous sol with alkali metal compound. No. 2,380,945. Paul Collins to Austenal Laboratories, Inc.

Vulcanizing polymerized glycol monoacrylate which comprises dispersing therein octamethylene diisocyanate. No. 2,381,063. Frederick Kung to The B. F. Goodrich Co.

Subresinous ester-linked acylated derivatives of a water-insoluble high molal hydroxy acid amide, etc. No. 2,381,116. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.

Sub-resinous ester-linked acyl derivatives of a water-insoluble detergent-forming monocarboxy acid amide. No. 2,381,117. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.

Sub-resinous ester-linked acylated derivative of a basic polyamino ether alcohol having basic amino nitrogen atoms linked by divalent ether radical -R-O-R-. No. 2,381,118. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.

Making dental floss which comprises forming a thread of synthetic fibers of an unplasticized vinyl resin and partially fusing fibers by passing thread through a wax bath. No. 2,381,142. Albert Stonehill to Johnson & Johnson.

Plasticized compositions comprising material selected from film-forming resins and cellulose esters and ethers and as plasticizer a mixture of pentaerythritol diacetate dipropionate and dipentaerythritol triacetate triproprionate. No. 2,381,247. Robert Barth and Harry Burrell to Heyden Chemical Corp.

Abrasive article comprising abrasive grains and bond containing vulcanization product of mixture of rubber, sulphur to vulcanize rubber to hard rubber, and polymerized chloro-2-butadiene-1,3. No. 2,381,266. Charles Drake to United States Rubber Co.

Abrasive article comprising abrasive grains and bond containing vulcanization product of mixture of a copolymer of butadiene and compound described. No. 2,381,267. Charles Drake to United States Rubber Co.

Copolymer containing 39% trichlorethylene and 61% vinyl trimethylacetate. No. 2,381,338. William Cornthwaite and Norman Scott to E. I. du Pont de Nemours & Co.

Cement comprising butyl formate, and synthetic rubber-like material made by interpolymerizing mixture including butadiene and acrylonitrile. No. 2,381,388. William Tann to The Firestone Tire & Rubber Co.

Forming abrasion-resistant surface upon body comprising a thick, stiff layer of plastic of low abrasion resistance and having a non-planar surface. No. 2,381,495. Frank Hall to Pittsburgh Plate Glass Co.

Cellulose ester plasticized with an ester of polyglycol and acid half-ester of a saturated monohydric alcohol and carbonic acid. No. 2,381,511. Irving Muskat and Franklin Strain to Pittsburgh Plate Glass Co.

Unvulcanized rubber-like polymer of a butadiene-1,3 compound and condensation product of ketone and a primary aliphatic amine. No. 2,381,526. Monte Throdahl to Monsanto Chemical Co.

Polymerization of vinyl compound, which comprises polymerizing in liquid phase and in presence of catalyst consisting of a peroxide of an aldehyde. No. 2,381,561. Hanns Staudinger, Karl Tuerck and Cyril Brighton to The Distillers Co. Ltd.

Sub-resinous ester-linked acylated derivatives of a basic aminoalcohol. No. 2,381,575. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.

Sub-resinous derivatives of a hydroxylated acylated polyamine. No. 2,381,576. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.

Sub-resinous ester-linked acyl derivatives of a hydroxylated acylated amide. No. 2,381,577. Melvin DeGroote and Bernard Keiser to Petrolite Corp. Ltd.

Transparent regenerated cellulose wrapping sheeting carrying unpigmented film comprising chlorinated rubber, and, as stabilizer, a light metal naphthenate. No. 2,381,694. Paul Scrutchfield to Hercules Powder Co.

Addition polymerization of polymerizable unsaturated organic compound which contains a methylene group attached by olefinic double bond to carbon atom which comprises associating a periodate with unsaturated organic compound to initiate polymerization. No. 2,381,702. William Stewart to The B. F. Goodrich Co.

Rubber substitute which is heat-conversion product of composition comprising partially hydrolyzed polyvinyl ester, an inorganic oxidizing agent containing oxygen and a multivalent metal, and an aromatic halogen-containing oxidizing agent selected from picryl chloride, pentachlorophenol, etc. No. 2,381,720. Charles Brown to U. S. Rubber Co.

Processes and Methods

Centrifugal for continuous separation of a mixture having different melting points wherein such mixture is emulsified in liquid condition with a liquid inert and non-solvent with respect to materials. No. 2,379,993. August Henry Schutte.

Comminuating grit-containing solids carried by a flowing liquid stream in lower portion along with major amount of grit or other abrasive material in stream. No. 2,380,025. Corson Chase to Chicago Pump Co.

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Additional patents on all other classifications from the above volumes will be given next month.

Abstracts of Canadian Patents

Collected from Original Sources and Edited

Requests for further information or photostated copies of the patents reported below should be addressed to the Commissioner of Patents and Copyrights, Department Secretary of State, Ottawa, Canada.

CANADIAN PATENTS

Granted and Published July 24, 1945 (Continued)

Elastic, waxlike plastic composition comprising minor proportion of plasticized polyvinyl acetal resin and major proportion of high molecular weight fatty acids and waxes. No. 428,930. Joseph D. Ryan.

Decolorizing soluble sulphonated oils by treatment with a peroxide in presence of soluble phosphate. No. 428,953. Buffalo Electro-Chemical Co. (Hans A. Kauffmann, R. L. McEwen)

Plastic bulb photoflash lamp, and method of manufacture. No. 428,955. Canadian General Electric Co. Ltd. (M. Pipkin)

Process for the isolation of glycol aldehydes and glyceric aldehydes, producible by condensation of formaldehyde, by reacting with an acyclic alkyl thiol to yield separatable mercaptals and mercaptols. No. 428,962. Canadian Industries Ltd. (R. S. Schreiber)

Polymeric sulphonamide free from carboxylic amide groups, and method of manufacture. No. 428,963. Canadian Industries Ltd. (G. J. Berchet)

Manufacture of polymeric sulphonamides by reaction of an aromatic disulphonyl halide and a diamine. No. 428,964. Canadian Industries Ltd. G. J. Berchet)

Continuous process for production of hydroxy aldehydes and hydroxy ketones. No. 428,965. Canadian Industries Ltd. (W. E. Handford, R. S. Schreiber)

Polymer of ester of ethylenesulphonic acid, and copolymers of such with styrene, vinyl acetate, methyl methacrylate, vinyl chloride, vinyl bromide, methyl alpha chloroacrylate, chloroprene, 1,3-butadiene, and methyl vinyl ketone. No. 428,966. Canadian Industries Ltd. (V. V. Alderman, W. E. Hanford)

Manufacture of film forming material by polymerizing divinylacetylene in presence of n-octyl-mercaptan, and isolating liquid product non-volatile at 150 Cent. No. 428,968. Canadian Industries Ltd. (A. M. Collins)

Reaction product of formaldehyde and calcium sulphamate, and mode of manufacture. No. 428,969. Canadian Industries Ltd. (J. F. Walker)

Moth-proofing furs by immersing in formaldehyde solution for more than 7 hours, in presence of common salt to minimize swelling, with pH not over 2.5, dry cleaning, and dyeing. No. 428,971. Canadian Industries Ltd. (D. Traill, A. McLean)

Mothproofing wool, by treating the scoured wool product with acidified aqueous solution of formaldehyde with pH not exceeding 1.0 as measured at 20 Cent. No. 428,973. Canadian Industries Ltd., assignee of Imperial Chemical Industries Ltd. (A. McLean, D. Traill)

Production of packages having tightly fitting wrappers by shrink-fitting polyvinyl alcohol film thereon. No. 428,975. Canadian Industries Ltd. (W. H. Charch)

Welding rod coating of potassium silicate having SiO_2:K_2O mole ratio of about 3.25. No. 428,976. Canadian Industries Ltd. (P. C. Lemmerman)

Production of polymers by heating, under anhydrous conditions, alpha-methylglucoside in presence of acidic catalyst, and removing alcohol so formed. No. 428,977. Canadian Industries Ltd. (R. S. Schreiber, J. H. Werntz)

Process for preparation of 4-methyl hydroxy coumarins by catalytic condensation of a phenol and acetoacetic ester. No. 428,983. Carbide and Carbon Chemicals Ltd. (A. B. Boese Jr.)

Electrolytic method for the purification of magnesium chloride for the production of metallic magnesium. No. 428,986. Consolidated Mining and Smelting Co. of Canada Ltd. (R. Lepace, B. G. Hunt)

Improved process for electrolytic production of magnesium from magnesium chloride. No. 428,987. Consolidated Mining and Smelting Co. of Canada Ltd. (Wm. C. Gardiner)

Aircraft de-icing means, essentially composed of contour-fitting rubber or resin surface, with electrically conductive acetylene-black, rubber or resin, underlayer. No. 429,005. Honorary Advisory Council for Scientific and Industrial Research (T. R. Griffith, J. L. Orr)

Preparation of fibres from peanut protein by formation of spinning solution, and extrusion into coagulating bath. No. 429,007. Imperial Chemical Industries Ltd. (J. P. Dickson, Wm. Sever)

Spray dried alkyl sulphate detergent of improved detergent characteristics. No. 429,024. Procter & Gamble Co. of Canada Ltd. (W. S. Martin)

Method of manufacturing d-lysergic acid-d-l-hydroxybutylamide-2. No. 420,031. Sandoz A. G. (A. Stoll, A. Hofman)

Method of manufacturing d-lysergic acid-l-3-hydroxybutylamie-2. No. No. 429,032. Sandoz A. G. (A. Stoll, A. Hofman)

Preparation of saturated and unsaturated pregnane polycarbonyl compounds and their substitution products. No. 429,038. Society of Chemical Industry in Basle (Karl Meischer, Albert Wettstein)

Separation of difficultly separable aldehyde-ketone mixtures by oxidation of the aldehyde to acid, and subsequent recovery of ketone by distillation. No. 429,059. Camille Dreyfus (J. E. Bludworth)

Recovery of rubber from waste rubber articles by autoclave, high pressure treatment of such articles in their original form. No. 429,063. J. Hirschberger.

Granted and Published July 31, 1945

Manufacture of laminated sheets resistant to tearing in all directions, embodying use of fibrous web and fluffy mat of sisal waste. No. 429,081. Frank Edward Donovan.

Peat macerator design. No. 429,085. Irenee Gendron.

Continuous method for drying and part-carburizing peat or kindred materials. No. 429,099. Claes-Wilhelm Pilo.

Manufacture of 1-phenyl 2-methyl-ethylamino propan-l-ol by introducing ethyl group into 1-phenyl 2 methylamino propan-l-ol by reaction with an ethyl salt. No. 429,103. Robert S. Shelton.

Dry-spinning aqueous albuminous substances by addition of saponaceous materials. No. 429,104. Rudolf Signer.

Dry-spinning artificial threads from albuminous materials utilizing countercurrent gas drying. No. 429,105. Rudolf Signer.

Flux for use in metallic container seams composed of acetamide hydrochloride. No. 429,109. American Can Co. (D. E. Wobbe)

Plant hormone solution which when applied to stored vegetables inhibits sprouting. No. 429,121. Boyce Thompson Institute for Plant Research Inc. (A. E. Hitchcock, P. W. Zimmerman)

Machine for the manufacture of fibrous composites consisting of fibres and comminuted material, uniformly and intimately admixed. No. 429,122. The British Cotton Industry Research Association (T. C. Williams)

Resinous composition comprised of reaction product of urea, melamine, formaldehyde, and monochloroacetamide. No. 429,128. Canadian General Electric Co. Ltd. (G. F. D'Alelio)

Method of manufacturing tubing of synthetic linear polyamide. No. 429,134. Canadian Industries Ltd. (P. R. Austin)

Uniformly oriented tapered artificial bristle filament composed of synthetic linear polyamide and phenol-formaldehyde. No. 429,135. Canadian Industries Ltd. (A. F. Smith)

New cellulose derivative prepared from cellulose and compound having plurality of —N=C=X groups, wherein X is a chalcogen of atomic weight less than 33. No. 429,136. Canadian Industries Ltd. (W. E. Hanford, D. F. Holmes)

High dielectric strength composition comprising gamma polyvinyl chloride, an insoluble metal silicate which has been dispersed in water, coagulated with lead acetate, and dried. No. 429,156. The B. F. Goodrich Co. (Geo. H. Taft)

Electric insulating material composed of 46-70 percent alphamethyl styrene and 54-30 percent polystyrene. No. 429,161. International Standard Electric Corporation (Archibald Alan New)

Process for producing lignin sulphonate compounds free from non-ligneous organic impurities and being acid-insoluble and alkali-dispersible. No. 429,174. Marathon Corporation (C. H. Wausau)

Process for manufacture of ethylene oxide from aqueous solution of ethylene chlorohydrin. No. 429,190. Standard Oil Development Co. (W. W. Waterman)

Granted and Published August 7, 1945

Casting non-metallic, fluent materials, employing aluminum molds or dies the surface of which has been anodized. No. 429,210. Ernest Windsor Bowen.

Dehydration apparatus adaptable to continuous production. No. 429,225. Bertram Fair Lundy.

Fabric waterproofing composition comprised of linseed oil, turpentine, wax and acetic acid. No. 429,230. Alexandrine Paquette.

Dry, water-soluble aluminum cleaner composed of ammonium bisulfate and metaphosphoric acid. No. 429,245. Aluminum Company of America (R. H. Brown, R. B. Mears)

Sodium fluoride-ammonium dihydrogen phosphate compound for surface-cleaning aluminum. No. 429,246. Aluminum Company of America (R. H. Brown, R. B. Mears)

Water-soluble aluminum cleanser composed of sulfamic acid and sodium fluoride. No. 429,247. Aluminum Company of America (R. H. Brown, R. B. Mears)

Formation of hard, thermoplastic, lignocellulosic resins by reaction of natural lignocelluloses and phenol. No. 429,263. Burgess Cellulose Company (A. W. Schorger)

Coating fluorescent tubes with phosphor employing carbonaceous temporary binder. No. 429,264. Canadian General Electric Co. Ltd. (E. Lemmers)

Resinous reaction product of melamine, formaldehyde, and bis-(diamino s triazinyl) disulphide. No. 429,265. Canadian General Electric Co. Ltd. (G. F. D'Alelio, J. W. Underwood)

High temperature refractory, and method of manufacture, composed of discrete brucite granules dead burned at above 2600 Fahr, in presence of stabilizing agent. No. 429,272. Canadian Refractories Ltd., assignee of the Honorary Advisory Council for Scientific and Industrial Research (L. Hodnett)

Dust filtering material composed of porous, inorganic base coated with aqueous solution of zinc or lithium chloride, with or without addition of mannitol monolaurate as wetting agent. No. 429,289. Fiberglas Canada Ltd. (I. N. Smith)

Weather-resistant cement, setting at room temperature, basically magnesium oxychloride cement containing 1 to 10 per cent $MgHAsO_4$. No. 429,313. Minnesota Mining and Manufacturing Co. (Wm. E. Sohl, H. N. Stephens)

Rope, comprised of cabled assembly of strands of highly stretched, high tenacity saponified organic ester of cellulose. No. 429,344. Henry Dreyfus (D. Finlayson)

Deodorant for eliminating household cooking odors composed of apple pulp —rich in malic acid—and mountain ash berries. No. 429,350. (Franz Siegfreid Falticzek, Frantisek Sterk)

(To be continued)

Trademarks of the Month

A Checklist of Chemical and Chemical Specialties Trademarks

415,723. Marquette Mfg. Co., Inc., Minneapolis, Minn.; filed Oct. 13, 1941; Serial No. 447,749; for paint-like substance to cover metal from welding material; since Sept. 2, 1941.

415,736. Oakes & Co., as Tru-Test, Chicago, Ill.; filed Sept. 9, 1944; Serial No. 474,046; for lubricating oils and greases; since May 25, 1944.

415,745. Evercrete Corp., N. Y.; filed Apr. 11, 1945; Serial No. 481,985; for paint enamels; since December 1943.

416,040. American Oil & Supply Co., Newark, N. J.; filed Aug. 30, 1944; Serial No. 473,718; for oil and grease lubricants; since May 22, 1944.

416,042. Oakes & Co., also as Tru-Test, Chicago, Ill.; filed Sept. 9, 1944; Serial No. 474,048; for radiator cleaning compound, etc.; since May 25, 1944.

416,146. Logan Engineering Co., Chicago, Ill.; filed Apr. 7, 1943; Serial No. 459,692; for centrifugal separators of moisture and/or dust from flowing gases; since Aug. 25, 1937.

416,159. Woburn Chemical Corp., Kearny, N. J.; filed July 17, 1944; Serial No. 472,349; for drying oil for paints; since Dec. 7, 1943.

462,213. United States Gypsum Co., Chicago, Ill.; filed July 21, 1943; for oxides and hydrates of alkaline earths; since May 24, 1935.

469,104. H. A. Astlett & Co., N. Y.; filed Apr. 7, 1944; for insecticides; since December 1943.

470,330. Commercial Solvents Corp., N. Y.; filed May 17, 1944; for oil-soluble surface active chemical compositions of substituted oxazoline class; since Mar. 29, 1943.

474,125. The M. W. Kellogg Co., Jersey City, N. J., and N. Y.; filed Sept. 12, 1944; for ready mixed paints; since Aug. 1, 1944.

474,474. James Scott St. Barbe Baker, as James Scott Mfg. Co., London, England; filed Sept. 22, 1944; for inks; since 1927.

474,478. Corning Glass Works, Corning, N. Y.; filed Sept. 22, 1944; for laboratory glassware; since 1880.

475,496. Herbert J. Heribert, N. Y.; filed Oct. 19, 1944; for adhesives; since Sept. 1, 1944.

479,500. Union Carbide and Carbon Corp., N. Y.; filed Feb. 6, 1945; for flux for welding; since April 1939.

479,539. The Texas Co., N. Y.; filed Feb. 7, 1945; for lubricating oil; since May 1, 1937.

480,468. National Oil Products Co., Harrison, N. J.; filed Mar. 3, 1945; for fatty amines and amides possessing surface active properties; since Mar. 22, 1939.

480,563. Columbian Carbon Co., N. Y.; filed Mar. 7, 1945; for particulate carbon since Aug. 5, 1944.

480,606. Oakes & Co., as Tru-Test, Chicago, Ill.; filed Mar. 7, 1945; for radiator cleaning compound, etc.; since Sept. 15, 1944.

481,472. Fidelity Chemical Products Corp., Newark, N. J.; filed Mar. 29, 1945; for removing paints; since Mar. 2, 1945.

481,523. Cork Import Corp., N. Y.; filed Mar. 30, 1945; for asphaltic paints; since June 1933.

481,584. Monsanto Chemical Co., St. Louis, Mo.; filed Mar. 31, 1945; for waterproofing textiles and paper; since Nov. 16, 1944.

481,666. Derris, Inc., N. Y.; filed Apr. 3, 1945; for insecticides and fungicides; since Mar. 17, 1945.

481,672. Duncan R. Mackenzie, as Duncan Mackenzie Co., N. Y.; filed Apr. 3, 1945; for spot remover in stick form; since Dec. 22, 1944.

481,831. Boco Co., Cleveland, Ohio; filed Apr. 7, 1945; for metal polish; since Apr. 2, 1945.

481,863. Stauffer Chemical Co., San Francisco, Calif.; filed Apr. 7, 1945; for dry cleaning solvents; since Jan. 5, 1945.

481,944. The Dad & Lad Co., New Lenox, Ill.; filed Apr. 10, 1945; for paints; since June 1, 1928.

481,946. Eureka Products Co., Chicago, Ill.; filed Apr. 10, 1945; for polish; since June 1, 1937.

481,970. Wil-Co-Lene Mfg. Co., Newark, N. J.; filed Apr. 10, 1945; to inhibit formation of sludge, gums, and soot; since Dec. 28, 1939.

482,281. L & R Organic Products Co., Inc., N. Y.; filed Apr. 18, 1945; for dyes and dyestuffs; since June 13, 1934.

482,602. Wallerstein Co., Inc., N. Y.; filed Apr. 25, 1945; for removal of sizings from fabrics; since Mar. 14, 1945.

482,924. Defender Photo Supply Co., Inc., Rochester, N. Y.; assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.; filed May 3, 1945; for dry granulated photographic emulsion; since Feb. 23, 1945.

482,928. D. W. Haering & Co., Inc., Chicago, Ill.; filed May 3, 1945; for scale and corrosion control; since July 6, 1938.

483,044. The Tremco Mfg. Co., Cleveland, Ohio; filed May 5, 1945; for corrosion inhibiting coating liquids; since Apr. 21, 1945.

483,224. Georgia-Carolina Oil Co., Macon, Ga.; filed May 11, 1945; for insecticide; since Apr. 25, 1945.

483,314. Heyden Chemical Corp., N. Y.; filed May 14, 1945; for pentaerythritol and polypentaerythritol esters of organic acids; since Apr. 13, 1943.

483,315. Heyden Chemical Corp., N. Y.; filed May 14, 1945; raw materials for production of synthetic resins, paints, varnishes; since May 5, 1943.

483,338. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.; filed May 14, 1945; for agricultural chemicals having insecticidal properties; since Apr. 27, 1945.

483,345. Research Products Corp., Madison, Wis.; filed May 14, 1945; softening and conditioning water and silica gel; since June 1943.

483,412. Pacific Coast Borax Co., N. Y.; filed May 15, 1945; for borate ore for weed control; since Oct. 4, 1943.

483,464. West Virginia Pulp and Paper Co., N. Y.; filed May 16, 1945; for tall oil pitch; since Mar. 29, 1945.

483,850. Georgia Kaolin Co., Elizabeth, N. J.; filed May 28, 1945; for clays; since Sept. 10, 1937.

484,186. Sinclair Refining Co., N. Y.; filed June 5, 1945; for oil as energizer for cutting oils; since May 14, 1945.

484,219. Stauffer Chemical Co., San Francisco, Calif.; filed June 6, 1945; for agricultural parasiticides; since Jan. 2, 1925.

484,562. E. I. du Pont de Nemours & Co., Wilmington, Del.; filed June 15, 1945; for insecticide; since May 16, 1945.

Trademarks reproduced and described include those appearing in Official Gazette of U. S. Patent Office, August 14 to August 28.

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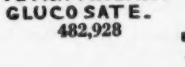

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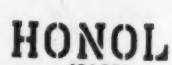

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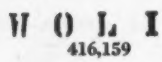

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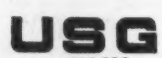

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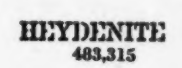

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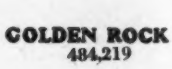

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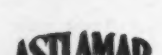

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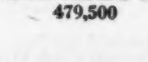

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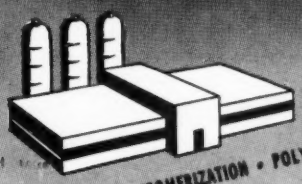
reaching out to tomorrow...



Industry's tomorrows merge with today as chemists and engineers find new and important applications for Anhydrous Hydrofluoric Acid. Research and development now point to many uses for this versatile chemical—as a catalyst for alkylation, acylation, isomerization and polymerization reactions; as a dehydrating agent and condensation reagent, as a fluorinating agent, etc.

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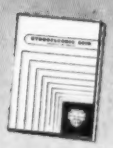
Organizations whose research, process planning or manufacturing programs utilize Anhydrous HF—or show need for a chemical of its characteristics—are invited to avail themselves of the services of the General Chemical Fluorine Division. At your disposal will be the experience, resourcefulness and technological "know how" of a company that pioneered in bringing this product out of the laboratory into the industrial forefront.



General Chemical Technical Service Bulletin 30-A, "Hydrofluoric Acid, Anhydrous and Aqueous," presents many important original data. It contains 24 pages of curves, charts, bibliography, etc., with special emphasis on the physical and chemical properties of Anhydrous HF and its use in organic syntheses. Copies may be obtained from the nearest General Chemical Sales and Technical Service Office below, or General Chemical Company, Fluorine Division, Dept. I-10 40 Rector Street, New York 6, N. Y.

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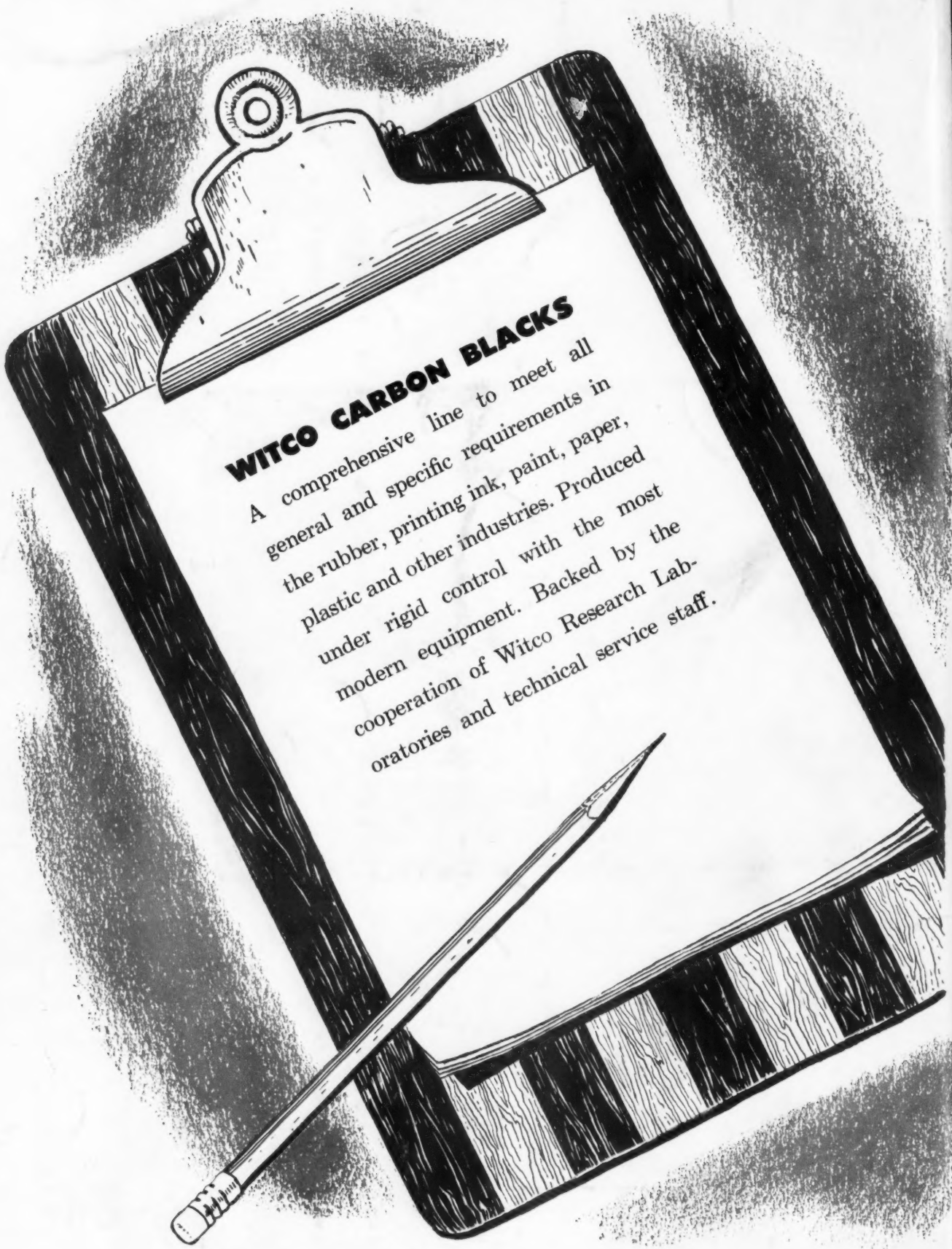

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